



Key Biodiversity Survey of Kurdistan, Northern Iraq

Site Review for Birds, Botany & Fisheries
Winter & Summer 08 Survey

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Key Biodiversity Survey of Kurdistan, Northern Iraq

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Winter & Summer 08 Survey

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KBA Team

The Key Biodiversity Areas (KBA) team mainly consisted of staff from Nature Iraq (NI) and the Iraqi Ministry of Environment (MoE):

Vascular Plants / Macrophytes — Saman Abdul Rahman (UofS), S. M. Muzher (NI), Adnan Ali Mer Jamsheer (KMoE) & Nora Jamel.

Fish - Haider Ibrahim (MoE), Ibrahim M. Abid (NI), & Muhammed Saed Muhammed Noori (KMoE).

Birds — Korsh Ararat (NI), Laeth Ali Abed (trainee) & Omar Fadhil.

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Introduction

This document presents field observations from the Key Biodiversity Areas (KBA) Survey conducted in January and February 2008 & May and June 2008, in the three northern governorates of Iraq: Sulaimani, Erbil and Duhok. This survey is a joint effort of Nature Iraq (NI), the Iraqi Ministry of Environment (MoE), and other partners including the Kurdish Ministry of Environment (KMoE), the Environmental Police, a division of the Pesh Merga, as well as the University of Sulaimani (UofS). The winter and summer 2008 survey represent the third and fourth seasonal surveys conducted in Kurdistan, Northern Iraq since the start of the project in February 2007. The field effort focused on the following surveys: bird, fish, botany, water quality physical parameters, phytoplankton, zooplankton and benthic macro invertebrates. This site review provides the basic findings of the species surveys (birds, fish, and botany) at each site to assist in the determination of whether the site meets KBA criteria.

KBAs are sites that are large enough or sufficiently interconnected to support viable populations of the species to which they are important. The KBA selection process uses four criteria based on the presence of four categories of species for which site-scale conservation is appropriate:

1. Globally threatened species;
2. Assemblage of restricted-range species;
3. Congregations of species that concentrate in large numbers at particular sites during some stage in their life cycle.
4. Assemblages of biome-restricted assemblages.

The KBA process is part of a large international effort to help in the establishment and prioritization of sites that are of global, regional and/or national importance. All sites are worthy of protection but conservation funds are limited and it is important to identify unique sites in Kurdistan-Iraq that are at risk of being lost or irreversibly damaged. The environment in Iraq has, after decades of war and civil strife, faced massive changes and degradation. Kurdistan-Iraq faced the destruction of thousands of its villages, chemical bombings and massive upheaval and migration of its population during the Anfal campaign of the previous Iraqi regime. Though the societal damage has been documented little has been done to examine the effects of these issues on the local environment. Underlying problems have also existed in the region for many decades if not several thousand years such as the extensive deforestation and overgrazing that has deforested many areas in Iraqi Kurdistan and continues to threaten the forests there today.

In a recent publication by the World Conservation Union (Langhammer, et al., 2007), the two key variables that determine how sites should be prioritized under a KBA Project are “Irreplaceability” and “Vulnerability”. A site is irreplaceable if it contains species that occur nowhere else or where an important segment of a species population utilizes the site consistently during part of the year (e.g. for migration or breeding). Vulnerability relates to sites where species can be found that are vulnerable or threatened from being extirpated either locally or globally. For two years the survey effort under the KBA Program has focused on the biodiversity of the Kurdistan Region of Iraq. Though a complicated and on-going process, the latest findings from the 2008 winter and summer survey effort are presented here.

Survey Area

The following table includes the site names and site codes with original GPS coordinates of the KBA Kurdistan Survey sites.

Table 1: KBA Kurdistan Survey Areas (areas highlighted in gray were surveyed in the summer survey only, areas surveyed in winter only have an “*”).

Governate	Site Name	Old Site Code	New Site Code	GPS Coordinates					
				Latitude (North)			Longitude (East)		
				°	'	''	°	'	''
Sulaimani	Darbandikhan Lake*	DL17	S1	35	8	53.6	45	46	45.9
Sulaimani	Dukan Lake*	DK1	S2	35	25.7	10.9	44	57	47.4
Sulaimani	Kalar (2 sites surveyed in winter, lower site only in summer)*	KA	S3	34	34	56.7	44	88	23.8
Sulaimani	Ahmed Awa	HW1	S4A	35	17.0	59.4	46	4.0	40.8
Sulaimani	Awesar	HW2	S4B	35	12.0	45.0	46	7.0	55.7
Sulaimani	Penjween	PA	S5	35	45	12	45	56.0	23
Sulaimani	Peramagroon	PM	S6	35	45.0	35.7	45	14.0	28.2
Sulaimani	Sargalu	SB	S7	35	52.0	30.8	45	9.0	54.3
Sulaimani	Mawat (not surveyed in 2008)	MA	S8	35	57.0	33.9	45	23.0	11.9
Sulaimani	Chamchamal*	CA	S9	35	25.0	17.0	44	37.0	6.0
Sulaimani	Chami Razan Area*	CR1	S10	35	48	31.3	45	1	14.4
Sulaimani	Qara Dagh Area	KD	S11	35	13	14.3	45	24	54.3
Sulaimani	Sharbazher		S13	35	57	1.4	45	33	49.4
Sulaimani	Zalm*		S12	35	18	22.9	45	58	12.5

Governate	Site Name	Old Site Code	New Site Code	GPS Coordinates					
				Latitude (North)			Longitude (East)		
				°	'	''	°	'	''
Sulaimani	Sangaw		S14	35	15	45.9	44	57	48.9
Erbil	Haji Omran Mountain	HO	E1	36	39	42.3	45	3.0	11.4
Erbil	Taq Taq*	TA	E2	39	9.0	15.5	43	56	24.3
Erbil	Altun Kopri Marsh*	AM1	E3	35	42.0	56.8	44	7.0	10.1
Erbil	Turaq Steppe*	TS	E4	36	9.0	15.5	43	56.0	24.3
Erbil	Doli (Valley) Smaquly	SV1	E5A	36	21.0	51.2	44	19.0	18.9
Erbil	Ashab Valley	SV2	E5B	36	17.0	34.4	44	22.0	41.5
Erbil	Jundyan (not surveyed in 2008)	JA2	E6	36	37.0	35.4	44	35.0	39.0
Erbil	Bakhma	BR	E7	36	27	25.8	43	50	54.8
Erbil	Barzan	BA1	E8	36	56.0	37.5	44	11.0	44
Erbil	Kherazook	KZ	E9	36	57.0	34.9	44	19.0	41.5
Erbil	Aski Kalak*	AA	E10	36	16.0	6.9	43	38.0	55.5
Erbil	Bahraka*	BS	E11	35	53	34.2	44	37	23.8
Dohuk	Gali Zanta	AQA2	D1A	36	44.0	27.7	43	58.0	20.4
Dohuk	Garbeesh Mountain	AQA3	D1B	36	48.0	49.6	43	57.0	47.5
Dohuk	Ser Amadia	AA2	D2A	37	2.0	34.3	43	32.0	3.3
Dohuk	Sulav Resort	AA1	D2B	37	6.0	29.1	43	28.0	51.2
Dohuk	Atrush	AT1A	D3	36	52.0	2.0	43	13.0	58.4
Dohuk	Bania Area (not surveyed in 2008)	AT2	D3C	36	55.0	34.8	43	12.0	11.6
Dohuk	Sarsink (not surveyed in 2008)	SeA1	D4	37	0.0	38.9	43	21.0	54.3
Dohuk	Garagu	GA	D5	37	1.0	53.6	43	23.0	51.6
Dohuk	Benavi	BM	D6	37	14.0	3.9	43	24.0	25.4
Dohuk	Zawita	ZF	D7	36	53.0	47.9	43	8.0	48.0
Dohuk	Mangeesh Valley	MA1	D8A	37	1.0	48.0	43	4.0	17.1
Dohuk	Road to Mangeesh	MA2	D8B	36	57.0	14.9	43	6.0	39.1
Dohuk	Sararu	DA	D13	37	13	45.2	43	28	45.7
Dohuk	Dohuk Lake*	DL	D9	36	53.0	9.2	43	0.0	26.8
Dohuk	Mosul Lake *	ML1	D10	36	44.0	28.2	42	47.0	10.1
Dohuk	Fishkhaboor Area – Syrian Border*	FA1	D11A	37	2.0	46.7	42	22.0	36.4

Governate	Site Name	Old Site Code	New Site Code	GPS Coordinates					
				Latitude (North)			Longitude (East)		
				°	'	"	°	'	"
Dohuk	Fishkhaboor Area - Turkish Border*	FA2	D11B	37	6.0	42.6	42	22.0	59.8
Dohuk	Kalakchi*	KaA1	D12A	36	33	59.4	43	31	54.4
Dohuk	Khazar*	KaA2	D12B	36	39	0.7	43	28	54.5

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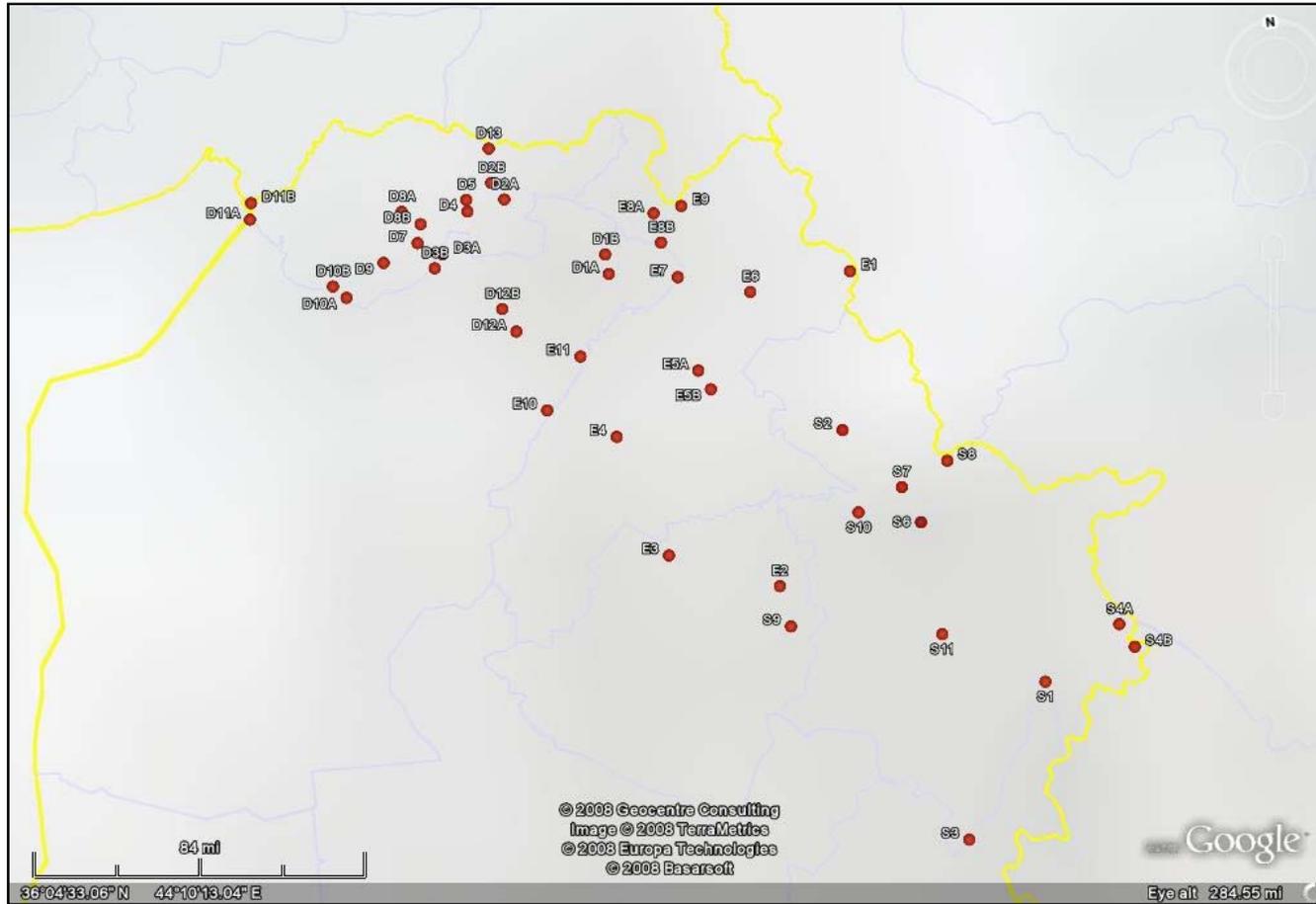


Plate 1: Map of Surveyed Areas in 2008 by Google Earth



Important Notes on Methods & Procedures

This document reports on birds, plant and fish species some of which are listed as of “conservation significance” or “conservation concern.” A complete list of these species for Iraq is presented in Annexes A, B and C.

Birds

Bird observations were done using 8x42 Minox binoculars and Kowa 500 mm spotting scopes (TSN-601). Depending on the type of sites point, area and/or transect counts were done. Identification was done using Salim et al. (2006), Porter et al. (1996) and Killian M. et al (1999). During the summer survey, a strong emphasis was placed on determining the breeding status of birds at the individual sites. Breeding evidence was based on guidelines adapted by Richard Porter based on BTO guidelines and coding for possible, probably and confirmed breeding was related to individuals observed in potentially suitable nesting habitat. The following table lists the breeding codes used.

Table 2: Breeding codes for Bird Observations

Possible breeder	
H	Species observed in breeding season in suitable nesting Habitat
S	Singing male present in breeding season in suitable breeding habitat
Probable breeding	
P	Pair observed in suitable nesting habitat in breeding season
D	Courtship and Display
A	Agitated behavior or anxiety calls from adults, suggesting probable presence of nest or young nearby
B	Nest Building
Confirmed breeding	
DD	Distraction-Display or injury feigning
UN	Used Nest or eggshells found
FL	Recently FLedged young (nidicolous species) or downy young (nidifugous species). Careful consideration should be given to the likely provenance of any fledged juvenile capable of significant geographical movement. Evidence of dependency on adults (e.g. feeding) is helpful. Be cautious, even if the record comes from suitable habitat.
ON	Adults entering or leaving nest-site in circumstances indicating Occupied Nest (including high nests or nest holes, the contents of which can not be seen) or adults seen incubating
FF	Adult carrying Faecal sac or Food for young
NE	Nest containing Eggs
NY	Nest with Young seen or heard

Plants

Please note that while some key plant species were identified at the sites, all species identified during the winter survey appeared in a dry or dormant state and thus many plants could not be identified because there were missing important parts needed for their identifications, especially for dry herbs and grasses. The Habitat Hectare Area Method (HHA) was used to survey plant coverage at most sites only during the winter survey. Maps generated from this method are included for some of the key sites. During the summer survey the HHA method was not used but more effort was made to determine the dominate tree, shrub, herb and grass species at the sites. In addition, the ecological condition of the site was rated on a scale of 1 to 5 with 1 representing the poorest ecological condition and 5 representing the highest ecological condition and quality. Plant identification was done using the following references: (Babashekh, 2006; Bermani, 1981; Ghahreman, 1983-2003; Hourri & Hourri, 2001, 2008; Maahzide, 2003; Mashhadni, 1992; Rawi, 1964; Raza & Dawood, 1983; Sardar, 2003; Townsend & Guest, 1966, 1968, 1974, 1980, & 1985).

Fish

Fish samples were collected by different methods such as dip nets (mesh size 10 mm), which were used in shallow areas along flowing streams. Also a 20 meter by 1.3 meter floated net (Mesh size 22 mm) was used in deep lakes and rivers. Fish samples were preserved in formaldehyde (10%) and brought to the lab. Identification was done using Al-Daham (1982), Mahdi (1962); and the personal website of fisheries expert Brian Coad (www.braincoad.com). Photographs were taken using a Sony digital point & shoot camera and any unidentified fish were kept in ethanol (90%) until it is possible to send them to experts in or outside of Iraq.

Site Review

1-Zalm Area (S12) - Elev. 513m (Winter & Summer)

Site Description: In winter 2008 an area was surveyed just for birds on the southwest bank of the Tanjero River north of Darbandikahn Lake. While the southwest bank is characterized by steppe habitat that is grazed and has some agricultural fields, the northeast bank is characterized by steppe and riparian habitats with extensive agriculture. Water levels at the site are affected by Darbandikhan Dam and, as with the rest of the lake, are extremely low at the time of observation in winter.

In summer, a different part of the Zalm area was surveyed (see GPS coordinates above) directly on the Zalm stream 13 km northeast of the site described above. This site is located to the southeast of Sulaimani City (about 40 km), with the presence of shrubs, trees, herbs and series of mountains to the north of the site (Suren Mountain), and a stream (Zalm Stream), which comes from the Hawraman Mountain (Ahmad Awa) in the northeast of the site, drains to the Tanjero and Darbandikhan Lake. The site is mainly used by farmers for agriculture.



Plate 2: Zalm (S12)

Winter Observations (23/2/08):

Birds: Some species that were observed include: Total count: 1110. Species Number: 34.

Some species that were observed include: Grey Heron (*Ardea cinerea*) (141), Night Heron (*Nycticorax nycticorax*) (15), Great White Egret (*Egretta alba*) (23), Little Egret (*Egretta garzetta*) (10), Eurasian Coot (*Fulica atra*) (2), Common Shelduck (*Tadorna tadorna*) (6), Eurasian Teal (*Anas crecca*) (11), Goldfinch (*Carduelis carduelis*) (12), Northern Raven (*Corvus corax*) (3), Little Owl (*Athene noctua*) (2), Mallard (*Anas platyrhynchos*) (64), Crested Lark (*Galerida cristata*) (20), White Wagtail (*Motacilla alba*) (6), Magpie (*Pica pica*) (10), Pied Kingfisher (*Ceryle rudis*) (8), Great Cormorant (*Phalacrocorax carbo*) (1), & Black-headed Gull (*Larus ridibundus*) (523).

Summer Observations (7/5/2008):

Birds: Total Bird count: 356 birds. Species number: 46.

Species seen at the site include the following: European Nightjar (*Caprimulgus europaeus*) (possible breeder) (1), Black-bellied Sandgrouse (*Pterocles orientalis*) (possible breeder) (12), Goldfinch (*Carduelis carduelis*) (probable breeder) (6), Hooded Crow (*Corvus corone cornix*) (possible breeder) (4), Cetti's Warbler (*Cettia cetti*) (possible breeder) (15), Tree Pipit (*Anthus trivialis*) (possible breeder) (4), Olivaceous Warbler (*Hippolais pallida*) (possible breeder) (2), Golden Oriol (*Oriolus oriolus*) (possible breeder) (8), Spotted Flycatcher (*Muscicapa striata*) (possible breeder) (18), Turtle Dove (*Streptopelia turtur*) (possible breeder) (1), Kestrel (*Falco tinunculus*) (confirmed breeder) (6), Magpie (*Pica pica*) (probable breeder) (9), and European Roller (*Coracias garrulous*) (non breeder) (2).

Other Wildlife Seen: One Common Jackal (*Canis aureus*) (LC)

Plants: Total species 55. Ecological condition: 4 (75% disturbed).

The dominant plants: Tree was *Salix aegyptiaca*; shrub was *Rubus sanctus*; herb was *Rumex crispus* and grass was *Hordeum* sp. At this site we record two species were *Celastegia sepium* and *Euphorbia boissieriana* for the first time in Kurdistan.

Fish: Total fish count: 21. Species number: 3.

The dominant fish species was *Cyprinion macrostomum* (Heckle, 1843) with a ratio of 92% but *Leuciscus* sp. (4%) and *Garra rufa* (4%) were record as well.

Conservation Significance: No birds of conservation significance were seen in winter. Birds of conservation concern for summer were: Hooded Crow (*Corvus corone cornix*), Turtle Dove (*Streptopelia turtur*), and European Roller (*Coracias garrulous*).

Conservation Issues: There is some hunting activity in this area and the summer survey area is affected by agriculture (extending croplands into the riparian area, agricultural run-off). This site is also used by people for picnicking, which has resulted in the accumulation of garbage at the site and the stream nearest the road is heavily impacted by car washing. Also some parts of the riparian area were burned. People living in the area said that animals were killed by this fire. Animal grazing is also impacting vegetation and water quality at the site.

2- IBA 004 - Darbandikhan (S1) - Elev. 463 m (winter) & Elev. 466 m (summer):

Site Description: Darbandikhan is a large, deep, fresh water lake of approximately 7500 ha, located 60 km southeast of Sulaimani City. It is fed by two rivers, the Tanjero in the north and the Sirwan in the east, and surrounded by mountains (Bashari, Zmnako, and Zawaly), that are covered in oak forests and/or steppe habitats. The lake and surrounding mountains support important numbers of birds. Water levels decline in summer after the spring melt due to dam releases until winter rains return in the late fall. During the 2008 survey, water levels were reduced due to severe drought affecting the region.



Plate 3: Darbandikhan Lake (S1)

Winter Observations (19, 20 & 21/1/2008):

Birds: Total Winter Bird count: 4076. Species Number: 63. Some species that were observed include: Mallard (*Anas platyrhynchos*) (1025), Great Cormorant (*Phalacrocorax carbo*) (890), Black-headed Gull (*Larus ridibundus*) (539), Chaffinch (*Fringilla coelebs*) (310), European Goldfinch (*Carduelis carduelis*) (257), and Armenian Gull (*Larus armenicus*) (133). Other birds were seen such as: Ruddy Shelduck (*Tadorna ferruginea*) (63), Great Black-headed Gull (*Larus ichthyæetus*) (67), Common Shelduck (*Tadorna tadorna*) (16), Eurasian Teal (*Anas crecca*) (52), Smew (*Mergellus albellus*) (18), Goldeneye (*Bucephala clangula*) (5), Grey Heron (*Ardea cinerea*) (81), Syrian Woodpecker (*Dendroscopus syriacus*) (17), Northern Raven (*Corvus corax*) (83), Little Egret (*Egretta garzetta*) (25), Great Crested Grebe (*Podiceps cristatus*) (3), Hooded Crow (*Corvus corone cornix*) (8), & Imperial Eagle (*Aquila heliaca*) (8).

Fish: Total fish count: 124. Species number: 17.

This was the richest fish site for the winter survey of 2008 in Kurdistan with 17 fish species; 3 species are introduced but the remainders are native fish. The fish in this site appear healthy and reached good weights. Furthermore, the native fish like *Barbus esocinus*, *B. xanthopterus* and *Capoeta damascina* reached optimum weight. Fishing is done using nets with mesh sizes ranging from 30 mm to 80 mm and is regulated by fishing moratoriums in the spring.

The dominant fish species were *Carassius carassius* (30%); followed by *Barbus xanthopterus* (10%), *B. grypus* (9%), *Capoeta damascina* (9%), *Cyprinus carpio* (7%), *Chondrostoma regius* (6%), *Acanthobrama marmada* (3%), *Alburnus mossulensis* (3%), *Alburnus caeruleus* (3%), *Aspius vorex* (2%), *B. esocinus* (2%), *Hypophthalmichthys nobilis* (2%), *Heteropneustes fossilis* (2%), *Mystus pelusius* (2%), *Silurus triostegus* (2%), *Ctenopharyngodon idella* (2%), and *Leuciscus lepidus* (2%).

Habitat: The region is mountainous with hills and rocky outcroppings covered by oak forest and steppe areas. There is a population of *Xanthium stamanium* on the west side of the lake and also near the lake there is a population of *Prunus orientalis* and *Phragmites communis*.

Summer Observations (16 & 17/5/2008):

Birds: Total Summer Bird count: 1244 birds. Species number: 55.

Species seen at the site include the following: Egyptian Vulture (*Neophron percnopterus*) (3 individuals) (probable breeder), Slender-billed Gull (*Larus genei*) (confirmed breeder) (760), Black-headed Bunting (*Emberiza melanocephala*) (probable breeder) (9), Armenian Gull (*Larus armenicus*) (probable breeder) (17), Eastern Rock Nuthatch (*Sitta tephronota*) (possible breeder) (4), Golden Oriole (*Oriolus oriolus*) (probable breeder) (7), Chukar (*Alectoris chukar*) (probable breeder) (2), Syrian Woodpecker (*Dendroscopus syriacus*) (probable breeder) (3), European Bee-eater (*Merops apiaster*) (probable breeder) (11), Steppe Buzzard (*Buteo b. vulpinus*) (passage migrant) (1), Goldfinch (*Carduelis carduelis*) (probable breeder) (15), Common Tern (*Sterna hirundo*) (confirmed breeder) (35), Black-headed Gull (*Larus ridibundus*) (confirmed breeder) (74), and Finsch's Wheatear (*Oenanthe finschii*) (probable breeder) (3).

Plants: No. of species 72, Ecological condition 3 (50% disturbed)

The dominant plant: Tree was *Quercus aegilops*; shrub was *Vitex sp*; herb was *Thymbra spicata* and grass was *Phragmites communis*. Two species were recorded in Kurdistan for the first time, which were *Serratula latifolia* and *Centuria irritans* and recorded *Juncus acutus* for the first time at Darbandikhan.

Fish: Total fish count: 52. Species number: 6. (The survey was conducted during the fishing moratorium and only one fisherman was able to assist the team in the collection of specimens).

Other Wildlife seen: One Grey Mongoose (*Herpestes edwardsi*) (LC) was seen

The dominant fish species was *Capoeta damascina* (70%), whereas other fish species recorded were *Cyprinus carpio* (7.6%), followed by *Alburnus mossulensis* (3.8%), *Babrus xanthopterus* (3.8%), *Mastacembelus mastacembelus* (3.8%), and *Chondrostoma regius* (3.8%). According to an interview with local fishermen the following fish species also exist in the lake: *Aspius vorax* (Heckel, 1843), *Barbus esocinus* (Heckel 1843), *Barbus grypus* (Heckel, 1843), *Cyprinion macrostomum* (Heckel, 1843), *Heteropneustes fossilis* (Bloch, 1794), *Silurus triostegus* (Heckel, 1843), and *Hypophthalmichthys molitrix* (Valenciennes, 1844).

Other Wildlife:

Conservation Significance: For winter, eight (8) Imperial Eagles (*Aquila heliaca*) were observed at the lake which is considered as globally threatened. Additionally, five (5) Goldeneyes were seen, a vagrant for Iraq, and eight (8) Hooded Crow (*Corvus corone cornix*) that are an endemic race to Iraq.

Birds of conservation concern for summer were: The IUCN Red-listed species Egyptian vulture (*Neophron percnopterus*), Finsch's Wheatear (*Oenanthe finschii*), Hooded Crow (*Corvus corone cornix*), Slender-billed Gull (*Larus genei*), Armenian gull (*Larus armenicus*), and Eastern Rock Nuthatch (*Sitta tephronota*).

Economically important fish found in the lake include the following: *Barbus esocinus*, *B. xanthopterus*, *B. grypus*, *Capoeta damascina*, *Cyprinus carpio* and *Carassius auratus*. Some of these fish such as Biz (*Barbus esocinus*), *B. grypus* and *B. Xanthopterus* are rare in southern Iraq and, as with Dukan discussed below, the fish in Darbandikhan may serve as stock to re-inject native fish species back as part of a rehabilitation effort to restore the Iraqi marshlands.

Conservation Issues: The polluted waters of the Tanjero River that enter the lake are of grave concern to human and environmental health. Comparatively, from the water quality survey done at the lake, this site had a higher density of the phytoplankton *Peridinium cinctum*, at levels known to be toxic to fish and to humans who eat these fish. The centric diatom seen in these waters,

Aulacoseira granulata also indicates polluted conditions. Given the extensive fisheries that exist in the lake itself, the pollution of the Tanjero River, likely caused primarily due to sewage and pollution inputs from the city of Sulaimani, needs to be cleaned up. Additionally most of the other diatoms recorded for Darbandikhan Lake are indicators of poor water quality.

The presence of the pollution-tolerant benthic organisms, *Physa* sp. 1 and *Gyraulus* sp., in the Diyala River below the Darbandikhan dam generally indicates that nutrient-enriched conditions and poor water quality can also be found in the waters leaving the reservoir and possibly affected by downstream pollution sources (sewage from the town of Darbandikhan). Sediment sampling showed elevated levels of lead and other heavy metals in the lake sediments.

At the end of July 2008, after the KBA survey was complete, a large fish kill occurred near the Tanjero input to the lake (by this point, drought conditions had dried up the Tanjero input). Other organisms (birds and reptiles appeared also to be affected). Three individuals were arrested for allegedly throwing poison into the lake to catch fish but other causes, some listed above, could have also caused the fish kill). Nature Iraq did some additional sampling at the lake in August, September and October. Fish tissue samples from fish collected in August 2008 showed elevated lead levels indicating that there are serious environmental and public health problems affecting the fisheries that must be dealt. For more information see the K-KBA Water Quality Review – 2008 and subsequent lab and field reports on Darbandikhan issues by Nature Iraq.

3- Kalar - (S3A) - Elev 274 & (S3B) - Elev. 202 (Surveyed in winter & summer)

Site Description: This site is located between two important bird areas, Darbandikhan to the north and Baquba Wetlands to the south. There are surrounding hills, some cultivated areas, and extensive riparian zones along the Diyala River, located to the southeast of Sulaimani City. The Diyala River travels south-southwest from the outlet of Darbandikhan and eventually enters the Tigris River south of Baghdad.



Plate 4: Kalar (S3A)

Winter Observations (22/1/2008):

Birds: Total Count: 282. Total Species: 42.

Some species that were observed include: Eurasian Teal (*Anas crecca*) (27), Great Cormorant (*Phalacrocorax carbo*) (14), Red-Wattled Plover (*Vanellus indicus*) 14, Common Snipe (*Callinago callinago*) (4), Imperial Eagle (*Aquila heliaca*) (1), Red-crested Pochard (*Netta rufina*) (2), Armenian Gull (*Larus armenicus*) (4), & Northern Raven (*Corvus corax*) (16).

Other Wildlife Seen: Wild Boars (*Sus scrofa*) (LC) (18) were seen at site S3-B.

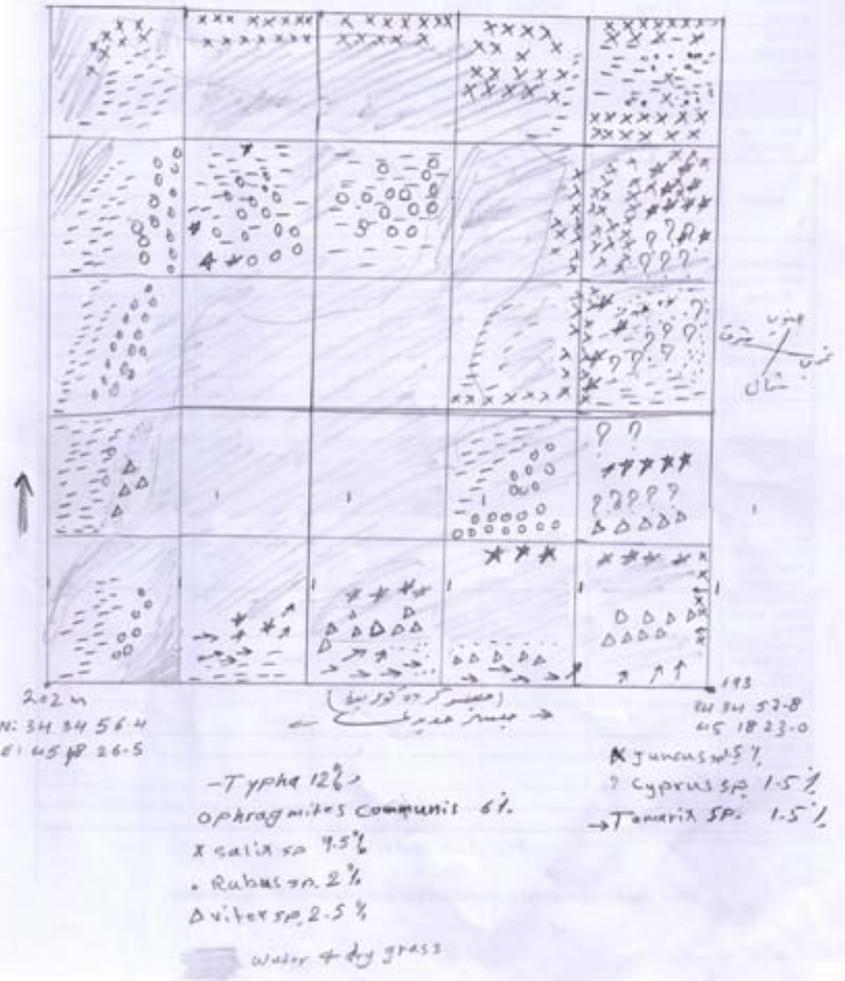
Fish: Total fish count: 2. Total species: 1 (*Garra rufa*).

It is a fast flowing, rocky area; there is little fishing activity in the river (none seen during the survey) due to a lack of a market fish (a few small fish were seen) and there were other fish in the market that were brought from the surrounding area (Darbandikhan).

Habitat: This site is located in the dry steppe area through which the Diyala River flows. Dry upland plants, as well as riparian species are at the site (percentages are approximate). *Typha* sp 12%, *Phragmites* 6%, *Salix* sp 9.5%, *Rubus* sp 2%, *Vitex* sp 2.5%, *Juncus* sp 1.5%, *Cyperus* sp 1.5%, *Tamarix* sp 1.5%.

site description

- An open area, dry old river is thought in it, surrounded by number of Agriculture field and cultivated in this region Triticum, oryza sativa, Hordeum sp, and others.
- Typical soil, clay, sand, and loam clay
- Threat factor over grazing.



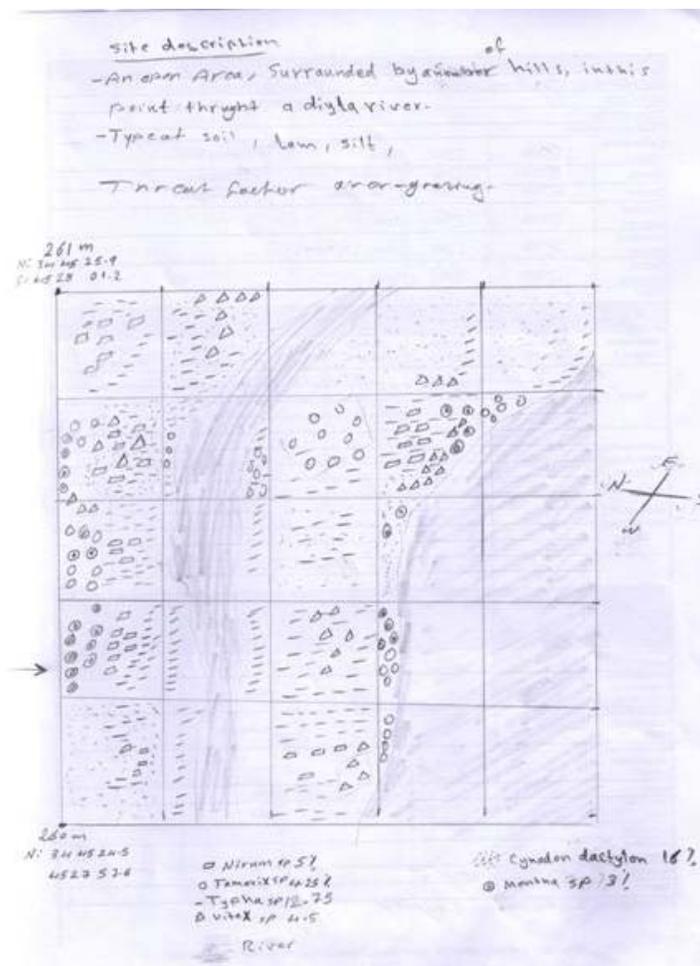


Plate 5 & Plate 6: HHA Maps of Kalar Sites A & B

Summer Observations (18/5/2008):

Birds: Total Bird count: 202 birds. Species number: 33.

Species seen at the site include the following: Dead Sea Sparrow (*Passer moabiticus*) (confirmed breeder) (48), Collared Pratincole (*Glareola pratincola*) (probable breeder) (6), Hooded Crow (*Corvus corone cornix*) (possible breeder) (5), Kestrel (*Falco tinunculus*) (possible breeder) (1), European Bee-eater (*Merops apiaster*) (probable breeder) (3), Little-ringed Plover (*Charadrius dubius*) (probable breeder) (8), Common Swift (*Apus apus*) (possible breeder) (3) and Yellow Throated Sparrow (*Petronia xanthocollis*) (probable breeder) (12).

Other Wildlife Seen: One Grey Mongoose (*Herpestes edwardsi*) (LC) was seen.

Plants: Number of plant species 35. Ecological condition: 4 (75% disturbed).

The dominant plants: Tree was *Salix aegyptiaca*; shrub was *Tamarix gallica* and *Taypha domingensis*; herb was *Mentha sativa* and grass was *Cynodon dactylon*. Three species were recorded in Kurdistan for the first time: *Brassica tournefortii*, *Dichanthium annulatum* and *Selesia sp.*

Fish: Total fish count: 27. Species count: 3

The dominant fish species was *Cyprinion macrostomum* (42%); also we recorded *Garra rufa* (28%), *Alburnus mossulensis* (30%).

Conservation Significance: For winter one (1) Imperial Eagle (*Aquila belialca*) was seen, which is a globally threatened species, also Red-crested Pochard (*Netta rufina*) was observed. Seven (7) Hooded Crows (*Corvus corone cornix*) were also seen. The latter is an endemic race in Iraq.

Birds of conservation concern for summer were: Dead Sea Sparrow (*Passer moabiticus*), Collared Pratincole (*Glareola pratincola*), Yellow-throated Sparrow (*Petronia xanthocollis*), Turtle Dove (*Streptopelia turtur*), and Hooded Crow (*Corvus corone cornix*) (5).

Conservation Issues: Gravel mining and sewage from the town of Kalar and other villages upstream affect the site. Further benthic macro-invertebrate sampling, identification, distribution, and abundance surveys should focus on the blackfly organism, *Simulium* sp., because it serves as a vector for the parasitic worm (*Onchocerca volvulus*) which causes the disease Onchocerciasis (River Blindness disease) worldwide. For more information see the K-KBA Water Quality Review – 2008.

4 - IBA 004 - Dukan (S2) - Elev. 482 m (winter) & Elev. 490 m (summer):

Site Description: This site is a large lake/reservoir of about 25,000 ha that is fed by Little Zap River from the northeast and the Hizop stream from the northwest. It is surrounded by mountains (Mt. Kosrat, Qarasrd, and Sara), hills, and lowland areas characterized by oak forests and steppe ecosystems. About 65 km northwest of Sulaimani City, there is a gorge that extends from the Turba Village to Bemusha Village. This gorge separates the larger northern part of the lake from the small southern part of the lake where the dam is located. Dukan town is located on the south side of the lake. Villages and towns with agricultural lands, such as Rania, Chwar Qurna, and Qala Dza surround the lake. The water level was low in the winter than in the summer, because throughout the previous summer water was released from the lake and rain in the winter had been infrequent. Thus snow pack was not substantial in the winter of 2008 and low melting snow from mountains in Iran and near the lake resulted in some of the lowest water levels seen at the lake in many years (this was true for Darbandikhan as well).



Plate 7: Dukan (S2)

Winter Observations (23, 25, and 26/1/2008):

Birds: Total Count: 3332. Species Number: 57.

Some species that were observed include: Great Cormorant (*Phalacrocorax carbo*) (1100), Black-headed Gull (*Larus ridibundus*) (680), Armenian Gull (*Larus armenicus*) (132) Great Black-headed Gull (*Larus ichthyaetus*) (127), Mallard (*Anas platyrhynchos*) (520), Eurasian Teal (*Anas crecca*) (15), Great Crested Grebe (*Podiceps cristatus*) (84), Grey Heron (*Ardea cinerea*) (56), Long-legged Buzzard (*Buteo rufinus*) (3), Steppe Buzzard (*Buteo b. vulpinus*) (2), Lapwing (*Vanellus vanellus*) (12), Greater White Fronted Goose (*Anser albifrons*) (33), Lesser White-Fronted Goose (*Anser erythropus*) (12), Greylag Goose (*Anser anser*) (43), & Imperial Eagle (*Aquila heliaca*) (2).

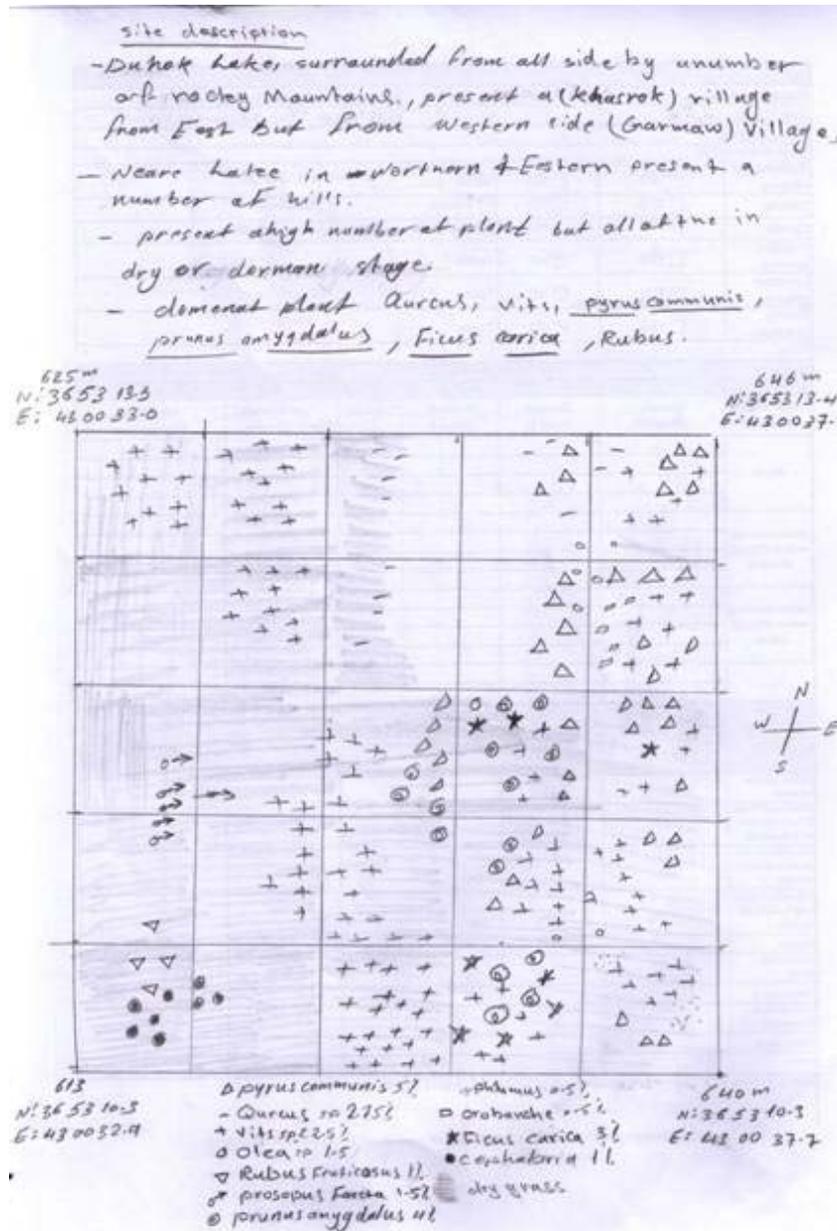
Fish: Total fish count: 184. Species Number: 17 (3 introduced species)

Other Wildlife seen: One Common Jackal (*Canis aureus*) (LC) was observed.

The dominant fish species were *Barbus grypus* (18%), followed by *Capoeta damascina* (13%), *Carassius carassius* (10%), *Barbus xanthopterus* (9%), *Cyprinus carpio* (9%), *Chondrostoma regius* (8%), *B. esocinus* (7%), *Cyprinion macrostomum* (5%), *Ctenopharyngodon idella* (5%), *Hypophthalmichthys nobilis* (5%), *Leuciscus Lepidus* (4%), *Silurus triostegus* (3%), *Heteropneustes fossilis* (2%), *Mastacembelus mastacembelus* (2%), and *Mystus pelusius* (2%).

This was the second richest fish site during the survey; the largest fish species sampled was Biz (*Barbus esocinus*), which reached a weight of 14 kg and a length of 107 cm. Fishing is done by nets with mesh sizes ranging from 30 mm to 80 mm.

Habitat: Northeast of the dam, the eastern side of the lake, there is a forest of planted *Pinus* sp. and *Eucalyptos* sp, with some *Thymbra spicata*, *Astragalus* sp, *Scrophularia deserti* and *Brassica* sp. This forms one plant community. On the western side of the lake near Turba village, the following species were common: *Morus* sp, *Punica* sp, *Phragmites* sp, *Rubus* sp. An extensive area near the town of Chwarqurna was covered by *Xanthium strumarium*.



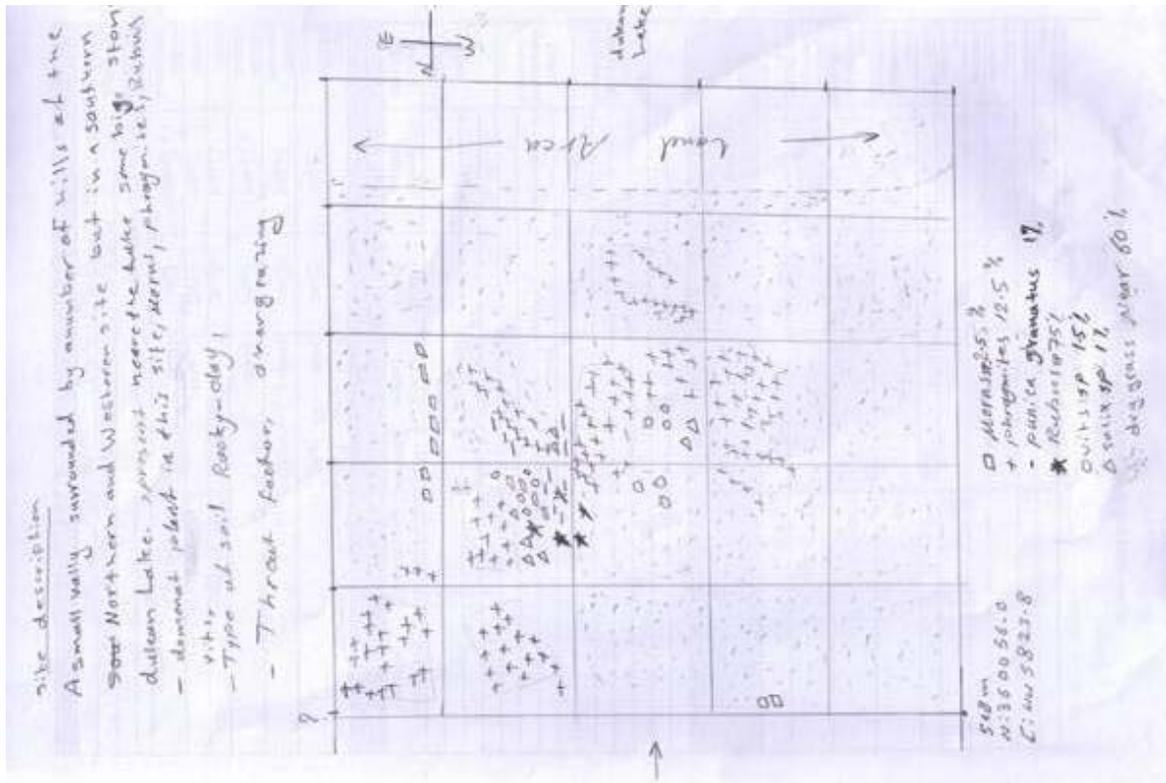
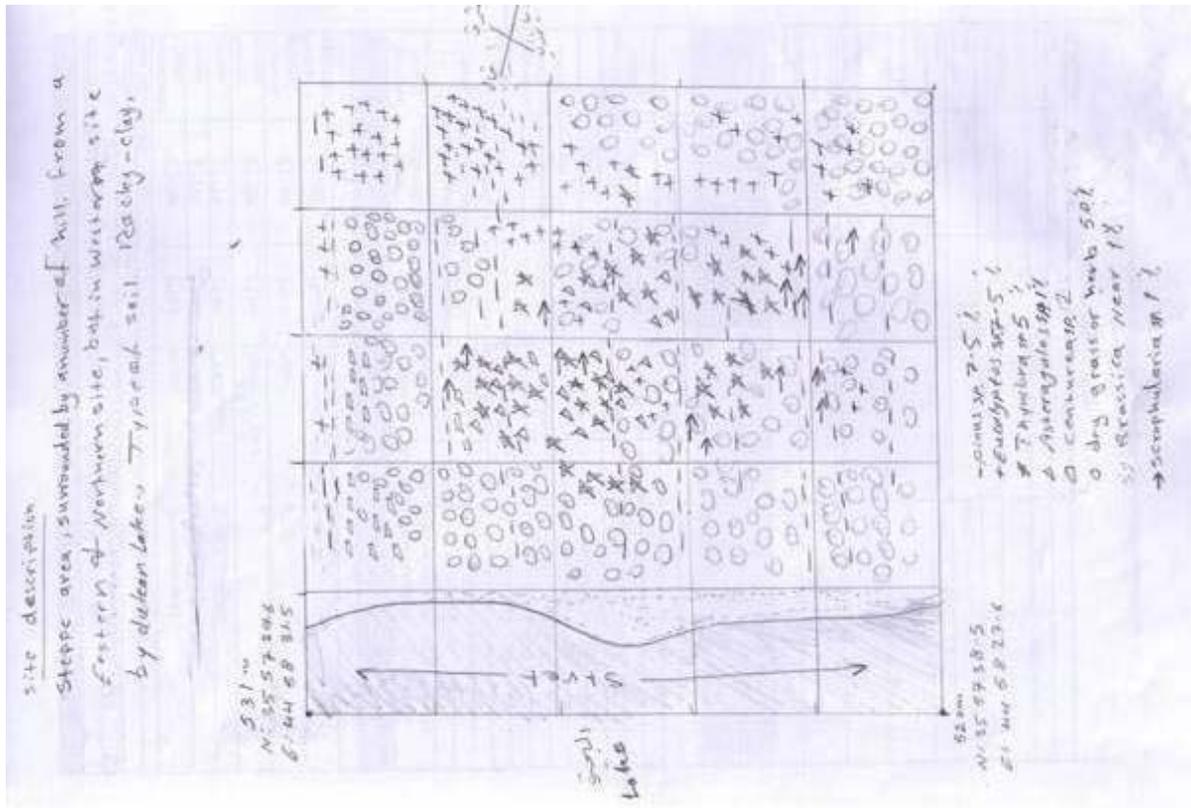


Plate 8, Plate 9 & Plate 10: Three HHA Maps of Dukan

Summer Observations (14 & 15/5/2008):

Birds: Total Bird count: 4320 birds. Species number: 59.

Species seen at the site include the following: Slender-billed Gull (*Larus genei*) (confirmed breeder) (3500), Armenian Gull (*Larus armenicus*) (probable breeder) (62), Black-headed Gull (*Larus ridibundus*) (confirmed breeder) (132), Common Tern (*Sterna hirundo*) (confirmed breeder) (185), Little Tern (*Sterna albifrons*) (confirmed breeder) (9), White-winged Black Tern (*Chlidonia leucopterus*) (possible breeder) (78), White Stork (*Ciconia ciconia*) (confirmed breeder) (9), White-cheeked Bulbul (*Pycnonotus leucogenys*) (probable breeder) (12), Eastern Rock Nuthatch (*Sitta tephronota*) (probable breeder) (5), Greenfinch (*Carduelis chloris*) (possible breeder) (1), Kestrel (*Falco tinnunculus*) (possible breeder) (2), Short-toed Eagle (*Circaetus gallicus*) (possible breeder) (1), and Egyptian Vulture (*Neophron percnopterus*) (confirmed breeder) (4).

Plants: Total species 90. Ecological condition: 3 (50% disturbed).

The dominant plants: Trees were *Pistacia eurycarpa* and *Quercus* sp; shrub was *Prunus orientalis*; herbs were *Cephalaria syriaca* and *Thymbra spicata* and grass was *Poaceae* family. Also we record two (2) species in Kurdistan at first time were *Phagnalon rupestre* and *Campanula gilliatii*.

Fish: Species number reported: 12.

Alburnus mossulensis (Heckel, 1843); *Capoeta damascina* (Valenciennes, 1842), and *Cyprinion macrostomum* (Heckel, 1843) were observed. It is important to note that as part of a management plan to protect fish spawning in the area the Kurdistan Ministry of Agriculture prohibits fishing from mid-May to the end of July. When the team visited the site in summer it had to depend on interviews with local fisherman to gather information for other fish species in the lake. These include: *Aspius vorax* (Heckel, 1843), *Carassius auratus* (Linnaeus, 1758), *Cyprinus carpio* (Linnaeus, 1758), *Heteropneustes fossilis* (Bloch, 1794), *Mastacembelus mastacembelus* (Banks & Solander, 1794), *Silurus triostegus* (Heckel, 1843), Biz (*Barbus esocinus*); Shaboot (*B.grypus*) and Kattan (*B. Xanthopterus*).

Conservation Significance: Birds of conservation concern in winter were: Lesser White-Fronted Goose (12) and Imperial Eagle (2). Both are globally threatened species. Birds of conservation concern in summer are: the IUCN Red-listed species Egyptian Vulture (*Neophron percnopterus*), Slender-billed Gull (*Larus genei*), Armenian Gull (*Larus armenicus*), Eastern Rock Nuthatch (*Sitta tephronota*), Collared Pratincole (*Glareola pratincola*), Finsch's Wheatear (*Oenanthe finschii*), White-cheeked Bulbul (*Pycnonotus leucogenys*), Masked Shrike (*Lanius nubicus*), and Hooded Crow (*Corvus corone cornix*).

Economically important fish were *Barbus esocinus*, *B. xanthopterus*, *Barbus grypus*, *Capoeta damascina*, *Cyprinus carpio* and *Carassius auratus*. For summer, Biz (*Barbus esocinus*), *B.grypus* and *B. Xanthopterus* were almost completely absent in southern Iraq and we thought it is under threat or near to endangered. This reservoir could serve as a stock that could be used to re-inject this native fish again into southern Iraq as part of re-habilitation effort to restore Iraq marshlands.

Conservation Issues: Hunting activities were found during winter in Dukan, especially in the northern part of the lake near the place where the Lesser White-Fronted Goose (*Anser erythropus*) were observed in winter. In order to protect the fisheries of the lake, the timing of fishing prohibitions requires greater study to improve our ability to provide adequate time for the maturation of fish eggs.

5-Chamchamal (S9) - Elev 557 (Surveyed in winter and summer)

Site Description: This area of about 5 km² includes the foothills located to 79 km east of Sulaimani City near the town of Chamchamal. Passing through this area is a small stream (Khra Azizy) running generally southward.



Plate 11: Chamchamal (S9)

Winter Observations (24/1/2008):

Birds: Total Count: 172. Species Number: 27.

Some species that were observed include: Imperial Eagle (*Aquila belialca*) (3), Long-legged Buzzard (*Buteo rufinus*) (3), Steppe Buzzard (*Buteo b. vulpinus*) (1), Lapwing (*Vanellus vanellus*) (18), Red-Wattled Lapwing (*Vanellus indicus*) (4), Spanish Sparrow (*Passer hispaniolensis*) (28), & Corn Bunting (*Emberiza calandra*) (18).

Fish: The site has a small stream with shallow water; one (1) fish species was recorded (*Garra rufa*).

Habitat: This is a valley surrounded by a number of small hills with an agricultural area in the middle of valley. Near the stream there is population of *Phragmites* sp, *Salix* sp, *Mentha* sp and *populus alba*.

Summer Observations (9/5/2008):

Birds: Total Bird count: 166 birds. Species number: 28.

Species seen at the site include the following: Iraq Babbler (*Turdoides altirostris*) (possible breeder) (2), Long-legged Buzzard (*Buteo rufinus*) (probable breeder) (2), White-cheeked Bulbul (*Pycnonotus leucogenys*) (possible breeder) (3), Yellow Wagtail (*Motacilla flava*) (possible breeder) (2), Red-backed Shrike (*Lanius collurio*) (possible breeder) (6), Rufous Bush Robin (*Cercotrichas galactotes*) (probable breeder) (11), and European Bee-eater (*Merops apiaster*) (probable breeder) (7).

Plants: Total species observed 57. Ecological condition: 4 (75% disturbed).

The dominant plants: trees were *Salix aegyptiaca* and *Populus alba*; shrub *Rubus sanctus*; herb was *silybum marianum* and grass *Phragmites communis*. Two (2) species were recorded for the first time in Kurdistan: *Brassica tournefortii* and *Euphorbia boissieriana*.

Fish: No fish were collected from this site during the summer survey.

Conservation Significance: Birds of conservation concern for winter is the globally threatened specie, Imperial Eagle (3). Birds of conservation concern for summer concern were: The near endemic bird Iraq Babbler (*Turdoides altirostris*), Hooded Crow (*Corvus corone cornix*), and White-cheeked Bulbul (*Pycnonotus leucogenys*).

Conservation Issues: This area is affected by human activity such as animal grazing, picnicking (people were cooking and throwing garbage) and urbanization (such as building houses and road construction).

6- Chami Rezan (S10) - Elev 647 (Surveyed in winter & summer)

Site Description: This site is located approximately 30 km to the west of Sulaimani City. It consists of a long valley with a stream (Tabben Stream) that flows from the northeast through the valley and into a narrow winding gorge to ultimately enter the Little Zap River. The landscape consists of hills and rocky ridges with sparse oak woodlands. There are some villages near the site and the area where there is a spring and a secondary stream that enters the Tabben there is a small resort area which is used for picnicking. There is a cave nearby as well as ancient ruins. The winter observations were for birds only.



Plate 12: Chami Rezan (S10)

Winter Observations (15/2/08):

Birds: Some species that were observed include: Griffon Vulture (*Gyps fulvus*) (18), Great Tit (*Parus major*) (27), Syrian Woodpecker (*Dendroscopus syriacus*) (9), Rock Bunting (*Emberiza cia*) (12), Long-legged Buzzard (*Buteo rufinus*) (2), Sparrow Hawk (*Accipiter nisus*) (1), Kestrel (*Falco tinnunculus*) (3), Raven (*Corvus corax*) (5), Jackdaws (*Corvus monedula*) (22), Goldfinch (*Carduelis carduelis*) (36), Chaffinch (*Fringilla coelebs*) (15), Magpie (*Pica pica*) (7), White Wagtail (*Motacilla alba*) (2), European Robin (*Erithacus rubecula*) (1), Eurasian Blackbird (*Turdus merula*) (2), European

Wren (*Troglodytes troglodytes*) (1), Nuthatch (*Sitta europaea*) (6), Eastern Rock Nuthatch (*Sitta tephronota*) (2), and Steppe Buzzard (*Buteo b. vulpinus*) (1).

Summer Observations (11/5/2008):

Birds: Total Bird count: 353 birds. Species number: 52.

Species seen at the site include the following: Egyptian Vulture (*Neophron percnopterus*) (probable breeder) (2), Kestrel (*Falco tinunculus*) (probable breeder) (4), Long-legged Buzzard (*Buteo rufinus*) (probable breeder) (1), Steppe Buzzard (*Buteo b. vulpinus*) (passage migrant) (2), Common Redstart (*Phoenicurus phoenicurus*) (possible breeder) (1), Eastern Rock Nuthatch (*Sitta tephronota*) (probable breeder) (6), Masked Shrike (*Lanius nubicus*) (probable breeder) (3), Olivaceous Warbler (*Hippolais pallida*) (possible breeder) (3), Finsch's Wheatear (*Oenanthe finschii*) (probable breeder) (4), and Hooded Crow (*Corvus corone cornix*) (possible breeder) (2).

Other Wildlife Seen: Honey Badger (1)

Plants: Total species observed 45. Ecological condition: 4 (75% disturbed).

The dominant plants: Trees were *Salix aegyptiaca* and *Quercus* sp; shrub was *Ziziphora capitata*; herbs were *Mentha* sp and *Echinops heteromorphus* and grass was *Taypha domingensis*. We recorded *Onosma asperimum* for the first time in Kurdistan.

Fish: Total fish count: 8. Species number: 3.

Other Wildlife seen: One European Badger (*Meles meles*) (LC), and one Grey Mongoose (*Herpestes edwardsi*) (LC) were seen.

Dominant fish species were *Alburnus mossulensis* (70%); followed by *Cyprinion macrostomum* (10%) & Loach (*Cobitis* sp) (20%).

Conservation Significance: Eastern Rock Nuthatch (*Sitta tephronota*) is a species of conservation concern for winter. Birds of conservation concern in summer are The Red-listed species Egyptian Vulture (*Neophron percnopterus*), Hooded Crow (*Corvus corone cornix*), Finsch's Wheatear (*Oenanthe finschii*), and Masked Shrike (*Lanius nubicus*).

Conservation Issues: Cattle and sheep grazing occur throughout the area. Other human impacts on this site include agricultural impacts to Tabben stream, sewage and garbage from the resort area and the villages.

7- Peramagroon (S6) - Elev 1581m (Surveyed in summer only):

Site Description: This is a high mountain located north of the city of Sulaimani, which has snow in winter. It is accessed from the road to Dukan. Peramagroon valley (which has the small village of Zewei) lies below the mountain in a wide bowl. There is agriculture on the slopes (primarily grape). An area above the village, from which a seasonal spring issues, is used as a picnicking area and resort. This area was subject to chemical attacks in the past.



Plate 13: Peramagroon (S6)

Summer Observations (11/5/2008):

Birds: Total Bird count: 195 birds. Species number: 37.

Species seen at the site include the following: Egyptian Vulture (*Neophron percnopterus*) (probable breeder) (2), Griffon Vulture (*Gyps fulvus*) (probable breeder) (4), Blackcap (*Sylvia atricapilla*) (probable breeder) (5), Menetries Warbler (*Sylvia mystacea*) (possible breeder) (2), Blackbird (*Turdus merula*) (probable breeder) (5), Goldfinch (*Carduelis carduelis*) (probable breeder) (4), Golden Oriol (*Oriolus oriolus*) (probable breeder) (3), Hooded Crow (*Corvus corone cornix*) (possible breeder) (3), Sombre Tit (*Parus lugubris*) (possible breeder) (1), Blue Tit (*Parus caeruleus*) (possible breeder) (2), Great Tit (*Parus major*) (probable breeder) (3), and Eastern Rock Nuthatch (*Sitta tephronota*) (possible breeder) (9).

Plants: Total species 45. Ecological condition: 2 (25% disturbed).

The dominant plants: trees were *Juglans regia* and *Quercus aegilops*; shrubs were *Rosa eglanteria* and *Vitis* sp; herbs were *Vicia variabilis* and *Pedicularis* sp and grass was *Aegilops* sp. We recorded *Fibigia macrocarps* for the first time in Kurdistan.

Fish: There are no fish at this site.

Conservation Significance: Birds of conservation concern were: The IUCN Red-listed species Egyptian Vulture (*Neophron percnopterus*), Finsch's Wheatear (*Oenanthe finschii*), Hooded Crow (*Corvus corone cornix*), and Eastern Rock Nuthatch (*Sitta tephronota*).

Conservation Issues: Human impacts at this site include animal grazing, agricultural chemical use, garbage and sewage from the resort and the village below.

8- Sargalu (S7) - Elev 931 (Surveyed in summer only):

Site Description: This is a mountainous area with valleys and rocky ridges located to the northwest of Sulaimani City. There are many small springs that come from the surrounded mountains and join to form a small stream. In the middle of the valley there is a plant

community of trees (*Populus alba*, *Morus* sp, *Juglans* sp, and *Quercus* sp (the latter also on a the surrounded mountains), shrubs and herbs (*Scropholaria* sp, *Alcia* sp, and *Centuria*).



Plate 14: Sargalu (S7)

Summer Observations (12/5/2008):

Birds: Total Bird count: 145 birds. Species number: 36.

Species seen at the site include the following: Short-toed Eagle (*Circaetus gallicus*) (possible breeder) (1), Griffon Vulture (*Gyps fulvus*) (probable breeder) (2), Syrian Woodpecker (*Dendroscopus syriacus*) (possible breeder) (2), Sombre Tit (*Parus lugubris*) (probable breeder) (4), Spotted Flycatcher (*Muscicapa striata*) (possible breeder) (9), Grey Wagtail (*Motacilla cinerea*) (probable breeder) (2), and Masked Shrike (*Lanius nubicus*) (probable breeder) (4).

Plants: Total species 60. Ecological condition: 2 (25% disturbed).

The dominant plant: trees were *Populus alba* and *Juglans regia*; shrubs were *Prunus orientalis* and *Paliurus spina-christi*; herbs were *Adiantum capillusveneris* and *Phlomis olivieri* and grass was *Avena fatua*. Also recorded were three (3) species for the first time in Kurdistan, Iraq: *Centaurea macrocephala*, *Alcea tholozani*, *Centaurea urvillei* and *Prangos* sp.

Fish: No fish were collected from the site because the team as unable to catch them.

Conservation Significance: Egyptian Vulture (*Neophron percnopterus*), Finsch's Wheatear (*Oenanthe finschii*), Eastern Rock Nuthatch (*Sitta tephronota*) and Masked Shrike (*Lanius nubicus*).

Conservation Issues: Grazing and other human impacts such as picnicking and road construction and sewage pollution from the village are affecting the area.

9- Awesar (S4B) - Elev. 1660m (Surveyed in summer only):

Site Description: It is an area with valley, highlands and foothills located on the northeast of Sulaimani on the Iraq-Iran border, covered by walnut trees and poplar and. This is also a resort site where picnicking occurs.



Plate 15: Awesar (S4B)

Summer Observations (11/62008):

Birds: Total Bird count: 623 birds. Species number: 25.

Species seen at the site include the following: Kestrel (*Falco tinnunculus*) (possible breeder) (2), Short-toed Eagle (*Circus gallicus*) (probable breeder) (2), Sparrowhawk (*Accipiter nisus*) (possible breeder) (1), European Roller (*Coracias garrulus*) (probable breeder) (5), Hooded Crow (*Corvus corone coronix*) (possible breeder) (9), Great Tit (*Parus major*) (probable breeder) (450), Eastern Rock Nuthatch (*Sitta tephronota*) (possible breeder) (7), Finsch's Wheatear (*Oenanthe finschii*) (possible breeder) (2), Grey Wagtail (*Motacilla cinerea*) (possible breeder) (1), Goldfinch (*Carduelis carduelis*) (probable breeder) (9), Common Swift (*Apus apus*) (possible breeder) (6), Black-eared Wheatear (*Oenanthe hispanica*) (possible breeder) (1), and Common Cuckoo (*Cuculus canorus*) (possible breeder) (1).

Plants: Recorded 53 species. Ecological condition: 2

The dominant plants: tree was *Juglans regia*; shrubs were *Crataegus monogyna* and *Rosa galica*; herbs were *Hymenocrater longiflorus* and *centaurea virgata* and grass was *Hordeum glaucum*. Two (2) new species were recorded in Kurdistan for the first time: *Campanula cecilia* and *Rosa begeriana*.

Fish: No fish survey was done here as the stream here was very small.

Conservation Significance: Key species were: Hooded Crow (*Corvus corone coronix*), European Roller (*Coracias garrulus*), Eastern Rock Nuthatch (*Sitta tephronota*), and Finsch's Wheatear (*Oenanthe finschii*).

Conservation Issues: Road construction and human activities affected the area.

10-Ahmed Awa (S4A) - Elev. 374 m (Surveyed in summer only):

Site Description: It is a mountainous area with rocky slopes, valley with woodlands, and a big stream (Zalm Stream) as well as some villages in the valley.



Plate 16: Ahmed Awa (S4A)

Summer Observations (12/6/2008):

Birds: Total Bird count: 113 birds. Species number: 22.

Species seen at the site include the following: Kestrel (*Falco tinnunculus*) (possible breeder) (1), Long-legged Buzzard (*Buteo rufinus*) (possible breeder) (2), European Bee-eater (*Merops apiaster*) (probable breeder) (6), Golden Oriol (*Oriolus oriolus*) (probable breeder) (3), Magpie (*Pica pica*) (possible breeder) (14), Eurasian Jay (*Garrulus glandarius*) (possible breeder) (2), Sombre Tit (*Parus lugubris*) (possible breeder) (2), Great Tit (*Parus major*) (probable breeder) (11), Blue Tit (*Parus caeruleus*) (possible breeder) (4), Olivaceous Warbler (*Hippolais pallida*) (possible breeder) (1), Eastern Rock Nuthatch (*Sitta tephronota*) (possible breeder) (21), Blackbird (*Turdus merula*) (probable breeder) (2), Yellow Wagtail (*Motacilla flava*) (possible breeder) (6), Black-headed Bunting (*Emberiza melanocephala*) (probable breeder) (3), European Goldfinch (*Carduelis carduelis*)

(probable breeder) (7), Dipper (*Cinclus cinclus*) (possible breeder) (4), and Common Swift (*Apus apus*) (possible breeder) (2).

Plants: Recorded 50 species. Ecological condition: 3

The dominant plants: Trees were *Juglans regia* and *Quercus aegilops*; shrubs were *Capparis spinosa* and *Hedera helix* and herbs were *Anchusa italica* and *Cephalaria dichaeetophora*. Also recorded was a new genus for the first time: *Postia puberula*.

Fish: No fish samples were taken due to high current.

Conservation Significance: Birds of conservation concern were: Sombre Tit (*Parus lugubris*), and Eastern Rock Nuthatch (*Sitta tephronota*).

Conservation Issues: This area is impacted by grazing and, though it has had security problems in the past, it now attracts many visitors who picnic in the area resulting in associated impact from garbage and sewage.

11- Penjween (S5) – Elev. 1202 m (Surveyed in summer only):

Site Description: It is an open area surrounded by mountains and foothills near the border with Iran. A river coming from Iran flows through the area and there are many cultivated lands. Security has been poor in the area in the past but the site has been safe for all of 2008.



Plate 17: Penjween (S5)

Summer Observations (13/6/2008):

Birds: Total Bird count: 283 birds. Species number: 30.

Species seen at the site include the following: Little Grebe (*Tachybaptus ruficollis*) (possible breeder) (4), Little Bittern (*Ixobrychus minutus*) (possible breeder) (10), Kestrel (*Falco tinnunculus*) (possible breeder) (2), Short-toed Eagle (*Circaetus gallicus*) (possible breeder) (1), Black Kite (*Milvus migrans*) (probable breeder) (4), Green Sandpiper (*Tringa ochropus*) (non breeder) (9), European Bee-eater (*Merops apiaster*) (probable breeder) (23), Eurasian Hoopoe (*Upupa epops*) (possible breeder) (8), Syrian Woodpecker (*Dendroscopus syriacus*) (possible breeder) (6), Masked Shrike (*Lanius nubicus*) (possible breeder) (1), Woodchat Shrike (*Lanius senator*) (possible breeder) (2), Golden Oriol (*Oriolus oriolus*) (probable breeder) (5), Magpie (*Pica pica*) (probable breeder) (24), Great Tit (*Parus*

major) (probable breeder) (11), Blue Tit (*Parus caeruleus*) (possible breeder) (3), Great Reed Warbler (*Acrocephalus arundinaceus*) (possible breeder) (1), Olivaceous Warbler (*Hippolais pallida*) (possible breeder) (6), Black-headed Bunting (*Emberiza melanocephala*) (probable breeder) (12), Common Swift (*Apus apus*) (possible breeder) (3), and European Goldfinch (*Carduelis carduelis*) (probable breeder) (15).

Plants: -Recorded 62 species. Ecological condition: 2.

The dominant plants: tree was *Salix acmophylla*; shrub was *Rubus sanctus*; herbs were *Convolvulus sepium* and *Myriophyllum sp.* and grass was *Sorghum halepense*. Also recorded was new species in Kurdistan Iraq was *Sparganium americanum*.

Fish: Total fish count: 20. Species number: 3.

The dominant fish species was *Alburnus mossulensis* (60%), followed by *Sabanejewia aurata* (34%), and *Leuciscus sp.* (6%). *Sabanejewia aurata* was recorded for the first time.

Conservation Significance: Birds of conservation significance were: Little Grebe (*Tachybaptus ruficollis*) and Masked Shrike (*Lanius nubicus*).

The site located on the border of Iran is so valuable because some species can transport easily via the border especially *Balitorus sp.*, which has also been recorded near the Caspian Sea in Iran and was recorded for the first time in Iraq.

Conservation Issues: This area is adversely impacted by grazing and human activities. This site is a small stream. Some villages discharge sewage direct to the site so it needs to be protected from pollution sources.

12- Sharbazher Area (S13) - Elev. 1257 m (Surveyed in summer only):

Site Description: It is a mountainous area on the northeast of Sulaimani which is covered mainly by oak forest, valleys and foothills, and existing farmlands with cultivated plants. The Little Zap River (upstream of its input into Dukan Lake) passes through the area from east to west.



Plate 18: Sharbazher (S13)

Summer Observations (14/6/2008):

Birds: Total Bird count: 186 birds. Species number: 27.

Species seen at the site include the following: Chukar (*Alectoris chukar*) (probable breeder) (9), Kestrel (*Falco tinnunculus*) (possible breeder) (1), Sparrowhawk (*Accipiter nisus*) (possible breeder) (1), Long-legged Buzzard (*Buteo rufinus*) (confirmed breeder) (3), European Roller (*Coracias garrulus*) (probable breeder) (7), European Bee-eater (*Merops apiaster*) (probable breeder) (18), Syrian Woodpecker (*Dendroscopus syriacus*) (possible breeder) (2), Masked Shrike (*Lanius nubicus*) (probable breeder) (11), Woodchat Shrike (*Lanius senator*) (probable breeder) (16), Golden Oriol (*Oriolus oriolus*) (probable breeder) (3), Magpie (*Pica pica*) (probable breeder) (15), Eurasian Jay (*Garrulus glandarius*) (possible breeder) (17), Sombre Tit (*Parus lugubris*) (possible breeder) (17), Great Tit (*Parus major*) (possible breeder) (2), Blue Tit (*Parus caeruleus*) (possible breeder) (7), Olivaceous Warbler (*Hippolais pallida*) (possible breeder) (1), Finsch's Wheatear (*Oenanthe finschii*) (possible breeder) (4), Black-eared Wheatear (*Oenanthe hispanica*) (possible breeder) (1), Spotted Flycatcher (*Muscicapa striata*) (possible breeder) (2), and Common Swift (*Apus apus*) (possible breeder) (5).

Other Wildlife Seen: Locals reported that on the 2nd of August a group of wolves attacked a herd of sheep in this area.

Plants: Recorded 47 species. Ecological condition: 2 (25% disturbed).

The dominant plants: trees were *Quercus aegilops* and *Morus nigra*; shrub were *Datisca cannabina* and *Vitis vinifera*; herbs were *Acanthus dioscoridis* and *Euphorbia boissieriana* and grass was *Aegilops* sp. Recorded two rare species were *Rubus caesius* (Townsend, C.C. and Guest, E., 1966) and *Equisetum arvense* (Townsend, C.C. and Guest, E., 1966) for the first time at this site.

Fish: No fish survey was conducted here (the area was visited only by the bird/botany staff).

Conservation Significance: Key species are: European Roller (*Coracias garrulus*), Masked Shrike (*Lanius nubicus*), Sombre Tit (*Parus lugubris*), and Finsch's Wheatear (*Oenanthe finschii*).

Conservation Issues: This site is less impacted by grazing than most visited sites.

13- Qara Dagħ (S11) - Elev. 910 m (Surveyed in summer only):

Site Description: This area located on the south of Sulaimani City represents a mountainous area with many gorges, valleys covered by oak forest mainly, with rocky slopes and many farmlands and villages.



Plate 19: Qara Dagħ (S11)

Summer Observations (15/62008):

Birds: Total Bird count: 454 birds. Species number: 35.

Species seen at the site include the following: Lesser Kestrel (*Falco naumani*) (probable breeder) (2), Kestrel (*Falco tinnunculus*) (possible breeder) (1), Short-toed Eagle (*Circaetus gallicus*) (possible breeder) (1), Steppe Buzzard (*Buteo b. vulpinus*) (passage migrant) (1), Long-legged Buzzard (*Buteo rufinus*) (possible breeder) (1), Griffon Vulture (*Gyps fulvus*) (probable breeder) (9), Egyptian Vulture (*Neophron percnopterus*) (probable breeder) (4), European Roller (*Coracias garrulus*) (possible breeder) (3), European Bee-eater (*Merops apiaster*) (probable breeder) (64), Hoopoe (*Upupa epops*) (possible breeder) (1), Syrian Woodpecker (*Dendroscopus syriacus*) (possible breeder) (8), Masked Shrike (*Lanius nubicus*) (probable breeder) (14), Woodchat Shrike (*Lanius senator*) (probable breeder) (95), Golden Oriol (*Oriolus oriolus*) (probable breeder) (4), Magpie (*Pica pica*) (probable breeder) (7), Sombre Tit (*Parus lugubris*) (possible breeder) (1), Great Tit (*Parus major*) (probable

breeder) (9), Blue Tit (*Parus caeruleus*) (possible breeder) (5), Olivaceous Warbler (*Hippolais pallida*) (possible breeder) (3), Eastern Rock Nuthatch (*Sitta tephronota*) (possible breeder) (10), Finsch's Wheatear (*Oenanthe finschii*) (possible breeder) (2), Red-tailed Wheatear (*Oenanthe xanthopyrma*) (possible breeder) (2), Black-eared Wheatear (*Oenanthe hispanica*) (possible breeder) (17), Spotted Flycatcher (*Muscicapa striata*) (possible breeder) (1), and Common Swift (*Apus apus*) (possible breeder) (6).

Plants: Recorded 52 species, Ecological condition: 3 (50% disturbed)

The dominant plants: trees were *Quercus aegilops* and *Acer monspessulanum*; shrubs were *Anagyris foetida* and *Crataegus* sp; herbs were *Serratula grandifolia* and *Helicrysum armenium* and grass was *Rotraria cristata*. Also we recorded three (3) species in Kurdistan for the first time: *Centaurea macrocephala*, *Leontice minor* and *Cousinia mobayenii*.

Fish: Total fish count: 10. Species number: 2.

The dominant fish species was *Garra rufa* (70%), and *Capoeta damascina* (30%).

Conservation Significance: Birds of conservation concern were: Egyptian Vulture (*Neophron percnopterus*), European Roller (*Coracias garrulus*), Masked Shrike (*Lanius nubicus*), Sombre Tit (*Parus lugubris*), Eastern Rock Nuthatch (*Sitta tephronota*), Finsch's Wheatear (*Oenanthe finschii*), and Red-tailed Wheatear (*Oenanthe xanthopyrma*).

Conservation Issues: This area is impacted by urbanization (road construction mainly) and grazing.

14- Sangaw Area (S14) - Elev. 374m (Surveyed in summer)

Site Description: This is a flat area with some foothill representing a valley located 51 km southwest of Sulaimani City near the Sangaw Town. It has small water bodies that are made by small springs. There are also some villages nearby.



Plate 20: Sangaw Area (S14)

Summer Observations (15/6/2009):

Birds: Total Bird count: 110 birds. Species number: 11.

Species seen at the site include the following: See-see Partridge (*Ammoperdix griseogularis*) (probable breeder) (5), Rock Dove (*Colomba livia*) (probable breeder) (5), European Bee-eater (*Merops apiaster*) (probable breeder) (6), Woodchat Shrike (*Lanius senator*) possible breeder) (7), Raven (*Corvus corax*) (possible breeder) (17), Sand Martin (*Riparia riparia*) (possible breeder) (8), Barn Swallow (*Hirundo rustica*) (possible breeder) (6), Crested Lark (*Galerida cristata*) (possible breeder) (24), House Sparrow (*Passer domesticus*) (probable breeder) (13), Pale Rock Sparrow (*Petronia brachydactyla*) (possible breeder) (11), Common Swift (*Apus apus*) (possible breeder) (8).

Plants: Recorded 16 species. Ecological condition: 5

The dominant plants: tree was *Salix acmophylla*; shrubs were *Crataegus monogyna* and *Nerium oleander*; herbs were *Dianthus strictus* and *Thymus syriacus* and grass was *Hordium sp.* Also two (2) new species were recorded in Kurdistan Iraq for the first time: *Cousinia rhabhiostegia* and *Outreya carduiiformis*.

Fish: No fish survey was conducted at this site.

Conservation Significance: There were no birds of conservation significance seen at the site.

Conservation Issues: Grazing highly impacts the site.

15- Altun Kopri (E3) - Elev. 256m (Surveyed in winter & summer)

Site Description: A rare wetland habitat (similar in characteristics to the southern marshes) in Kurdistan that is surrounded by foothills and located southwest of Altun Kopri town, 55 km of southeast of Erbil City. The area is fed by the Little Zab from the northeast of Altun Kopri.



Plate 21: Altun Kopri (E3)

Winter Observations (29/1/2008):

Birds: Total count: 13160. Species Number: 38. Some species that were observed include: Eurasian Coot (*Fulica atra*) (11500), Wood Pigeon (*Columba palumbus*) (1200), Eurasian Jackdaw (*Corvus monedula*) (220), Eurasian Teal (*Anas crecca*) (33), Common Pochard (*Aythya ferina*) (8), Great Cormorant (*Phalacrocorax carbo*) (34), Pygmy Cormorant (*Phalacrocorax pygmaeus*) (18), Marsh Harrier (*Circus aeruginosus*) (16), Armenian gull (*Larus armenicus*) (8), & Grey Heron (*Ardea cinerea*) (6).

Fish: Total fish count: 35. Species number: 10.

Fish assemblage included *Liza abu* (20%), which is a detritivorous fish and requires thick sediment to survive, followed by *Chondrostoma regius* (20%), *Acanthobrama marmaid* (14%), *Barbus esocrinus* (9%), *Carassius carassius* (9%), *Aspius vorex* (8%), *Capoeta damascina* (8%), *Varicorhinus* sp. (5%), *Silurus triostegus* (3%), *Heteropneustes fossilis* (2%), and *Mystus pelusius* (2%).

Habitat: An open area, surrounded by a number of hills and agricultural fields. The main plants at the site and lining the river are *Phragmites* sp and *Juncus* sp. The dominant upland plants were *Cynodon* sp, *Vitex* sp, and *Tamarix* sp.

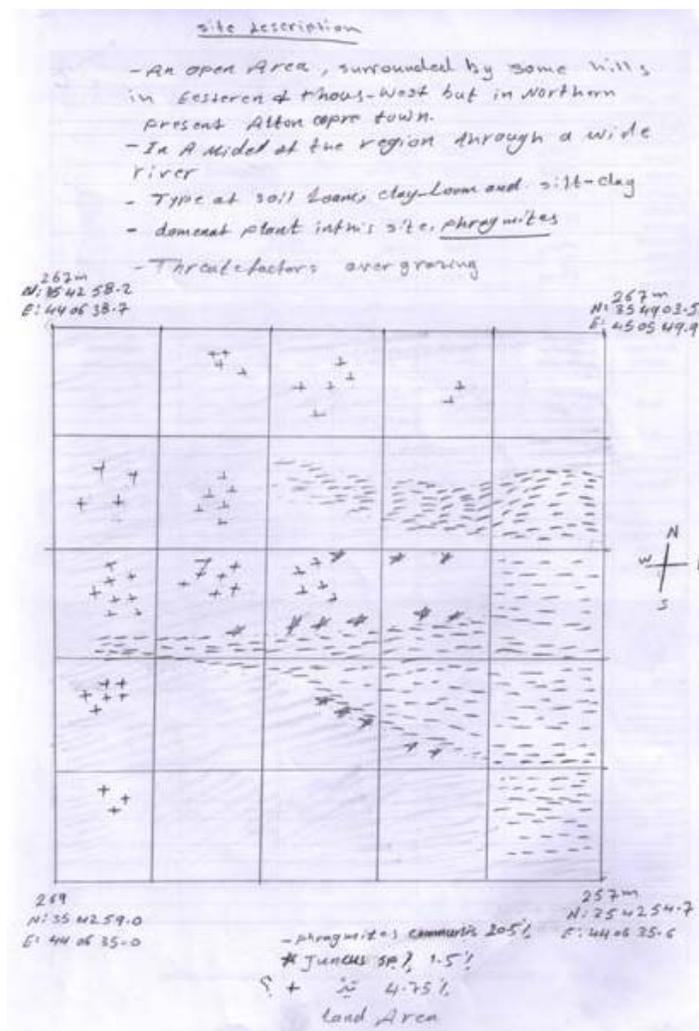


Plate 22: HHA Map of Alton Kopri

Summer Observations (27/5/2008):

Birds: Total Bird count: 367 birds. Species number: 31.

Species seen at the site include the following: Little Grebe (*Tachybaptus ruficollis*) (possible breeder) (2), Dead Sea Sparrow (*Passer moabiticus*) (confirmed breeder) (52), European Roller (*Coracias garrulus*) (possible breeder) (8), Hooded Crow (*Corvus corone coronix*) (probable breeder) (25), Masked Shrike (*Lanius nubicus*) (probable breeder) (2), Pin-tailed Sandgrouse (*Pterocles alchata*) (probable breeder) (9), Western Rock Nuthatch (*Sitta neumayer*) (probable breeder) (7),

Cormorant (*Phalacrocorax carbo*) (non breeder) (1), Marsh Harrier (*Circus aeruginosus*) (possible breeder) (1), Squacco Heron (*Ardeola ralloides*) (probable breeder) (9), Great Reed Warbler (*Acrocephalus arundinaceus*) (possible breeder) (12), and Black-headed Bunting (*Emberiza melanocephala*) (probable breeder) (4).

Plants: No. of species 25. Ecological condition: 4 (75% disturbed).

The dominant species: tree was *Populus euphratica*, shrub was *pteropyrum olivieri*, herbs were *Thymus syriacus* and *Potamogeton lucence*, and grass was *Phragmites communis*.

Fish: Total fish count: 27. Species number: 12.

The dominant fish species was *Cyprinus carpio* (16%), followed by *Acanthobrama marmaid* (12%), *Barbus xanthopterus* (12%), *Liza abu* (12%), *Varicorhinus sp.* (10%), *Barbus esocinus* (8%), *Aspius vorax* (7%), *Carassius carassius* (7%), *Capoeta damascina* (6%), *Mastacembelus mastacembelus* (4%), *Silurus triostegus* (3%), and *Heteropneustes fossilis* (3%).

Conservation Significance: For winter *Pygmy Cormorants* (18) were observed, which is of conservation concern because over 50% of the world population of this species breeds in the Middle East. The recording of Biz, *Barbus esocinus*, at this site is significant as it is a financially valuable species which requires good water quality to survive.

For summer, birds of conservation concern were: Little Grebe (*Tachybaptus ruficollis*), Dead Sea Sparrow (*Passer moabiticus*), European Roller (*Coracias garrulus*), and Western Rock Nuthatch (*Sitta neumayer*).

This is one of the most important fish sites due to the richness and existence of two (2) important fish species: Biz (*Barbus esocinus*) (Heckel, 1843) and Kattan (*Barbus xanthopterus*) (Heckel, 1843); also the ecosystem feature close to southern Iraq marshlands. *Liza abu*, a detritivorous fish absent in all north sites except E3, adds another concern to conserve this site.

Conservation Issues: As this site is located south (downstream) of the Altun Kopri Town it is affected by sewage and pollution from the town. In this site the locals mentioned that some people are fishing with poisons and primitive electro-fishing was seen being used to catch fish (the KBA team received its specimens from fisherman using this method).

Chironomid benthic macro-invertebrate species, (several different pollution-tolerant Chironomid species were seen at the site), *Chironomus annularius*, was previously recorded by Nature Iraq only in the southern Iraqi marsh surveys, was seen here as well as at S3A in Kalar and S1F in Darbendikhan. Also, *Tribelos sp. 3* was a first record at this site for Iraq. Sampling, identification, distribution and monitoring for these chironomids should be given further consideration. For more information see the K-KBA Water Quality Review – 2008.

16- Aski Kalak (E10) - Elev. 253m (Surveyed in winter only)

Site Description: This site is along the Great Zap River west of Erbil City which is a wide river at this point, traveling southwest, eventually entering the Tigris River. The area is surrounded by Khabat Town and Debaga Village on the eastern side and by Aski Kalak on the western side. There is a gravel mine to the northwest of the site.



Plate 23: Aski Kalak in winter (E10)

Winter Observations (30/1/2008):

Birds: Total Count: 225. Species Number: 32. Some species that were observed include: Mallard (*Anas platyrhynchos*) (17), Eurasian Teal (*Anas crecca*) (12), Night Heron (*Nycticorax nycticorax*) (18), Grey Heron (3), Great Cormorant (*Phalacrocorax carbo*) (8), White-Cheeked Bulbul (*Pycnonotus leucogenys*) (5), Red-Wattled Lapwing (*Vanellus indicus*) (12), Redshank (*Tringa tetanus*) (2), & Armenian Gull (*Larus armenicus*) (4).

Fish: Total fish count: 19. Species number: 4.

Four fish species were: *Garra rufa* represented 50%, followed by *Cyprinion macrostomum* (30%), *Leuciscus sp.* (10%), and *Mastacembelus mastacembelus* (10%), the rocky substrate helps the *Garra rufa* to be the dominant fish at this site.

Habitat: This is an open area surrounded by some hills on the east and southwest sides. Near this site is an area covered by *Cynodon sp.*, *Vitex sp.*, *Tamarix sp.* and some fields of *Populus alba*.

Conservation Significance: The species of conservation concern at this site is the White-Cheeked Bulbul (5).

Conservation Issues: There is high human impact on this area; primarily agriculture and gravel mining. The benthic macro-invertebrate, *Psephenidae sp.*, seen at the site is a first recording for such an important benthic organism in Iraq. This is good news because this species is known worldwide as a bio-indicator of good water quality, therefore more attention should be given to its identification, distribution, and abundance in Iraqi water bodies. *Pottthastia gaedii* and several midges were also first records for Iraq at this site. For more information see the K-KBA Water Quality Review – 2008.

17- Turaq Steppe (E4) - Elev. 368m (Surveyed in winter only)

Site Description: This is an agricultural area with about 2 km² of remaining steppe habitat, located to the southwest of Erbil City, with the Village of Turaq Village located on the north side of the surveyed site. This area is used for farming.



Plate 24: Turaq Steppe in winter (E4)

Winter Observations (30/1/2008):

Birds: Total Count: 275. Species Number: 17. Some species that were observed include: Black Redstart (*Phoenicurus ochrurus*) (1), European Goldfinch (*Carduelis carduelis*) (16), Starling (*Sturnus vulgaris*) (30), Common Chaffinch (*Fringilla coelebs*) (9), Chiffchaff (10), Short-toed Lark (11), Crested Lark (47), Eurasian Skylark (78), & Calandra Lark (15).

Fish: Dry site.

Other Wildlife Seen: A single Jackal was seen at the site.

Habitat: An agricultural area with a few plants species such as *Albagi maurorum*, *Prosopus* sp and some dry grasses.

Conservation Significance: There were no birds of conservation significance.

Conservation Issues: The site is impacted by the urbanization (building of new houses) and agriculture.

18- Taq Taq (E2) - Elev. 371m (Surveyed in winter & summer)

Site Description: This area is dominated by the slowly flowing Little Zap River with banks made of clay and silt (speed and flow levels fluctuate due to the opening and closing of the Dukan Dam upstream). The area is located in the southeast of Erbil Governorate. The village of Jom Haider is to the north of the survey area. The survey area is reached from the road to Taq Taq.



Plate 25: Taq Taq (E2)

Winter Observations (31/1/2008):

Birds: Total Count: 230. Species Number: 33.

Some species that were observed include: Night Heron (*Nycticorax nycticorax*) (2), Grey Heron (*Ardea cinerea*) (2), Kestrel (*Falco tinnunculus*) (3), Hen Harrier (*Circus Cyanens*) (1), Long-legged Buzzard (*Buteo rufinus*) (2), Moorhen (*Gallinula chloropus*) (4), Great Black-headed Gull (*Larus ichthyaetus*) (1), Pied Kingfisher (*Ceryle rudis*) (2), Eurasian Magpie (*Pica oica*) (14), Crested Lark (*Galerida cristata*) (15), Iraq Babbler (*Turdoides altirostris*) (8), & Eurasian Blackbird (*Turdus merula*) (9).

Fish: One fish species was noticed in this site (*Aspius vorex*). It is suspected that other fish inhabit the river but the survey team did not have the appropriate fishing equipment to conduct a full assessment for such a large river.

Habitat: This is an agricultural area surrounded by a number of hills. Plants in this site have produced a plant community consisting of both wild and cultivated plants. Wild plants include: *Populus euphratica*, *Rubus fruticosus*, *Phragmites communis*, *Tamarix* sp, *Brassica* sp, while cultivated species include: *Morus* sp, *Hibiscus* sp, *Allium* sp, *Prunus communis*, *Juglans* sp, and *Pyrus domesticus*.

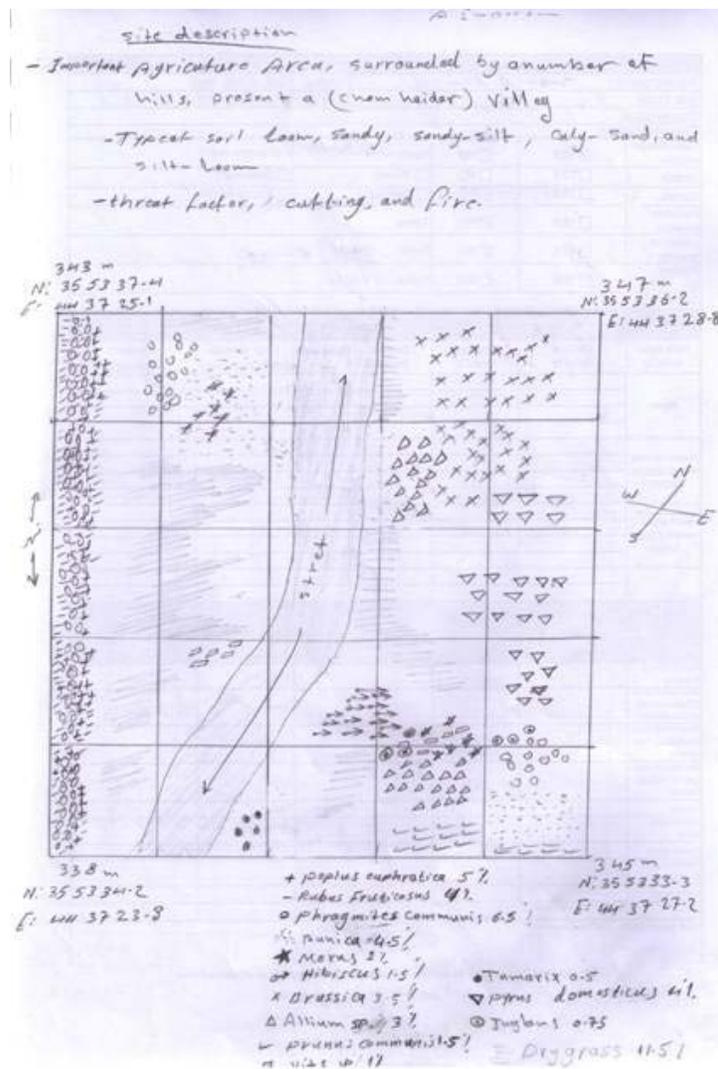


Plate 26: HHA Map of Taq Taq

Summer Observations (26/5/2008):

Birds: Total Bird count: 299 birds. Species number: 31.

Species seen at the site include the following: Egyptian Vulture (*Neophron percnopterus*) (probable breeder) (2), Hooded Crow (*Corvus corone coronix*) (probable breeder) (6), White-cheeked Bulbul (*Pycnonotus leucogenys*) (probable breeder) (8), Dead Sea Sparrow (*Passer moabiticus*) (confirmed breeder) (73), Iraq Babbler (*Turdoides alirostris*) (possible breeder) (2), European Roller (*Coracias garrulous*) (possible breeder) (4), Little Bittern (*Ixobrychus minutus*) (1 individual), Squacco Heron (*Ardeola ralloides*) (possible breeder) (4), Kestrel (*Falco tinnunculus*) (possible breeder) (2), Steppe Buzzard (*Buteo b. vulpinus*) (passage migrant) (1), Egyptian Vulture (*Neophron percnopterus*) (probable breeder) (2), Moorhen (*Gallinula chloropus*) (probable breeder) (15), Red-backed Shrike (*Lanius Collurio*) (possible breeder) (3), and Woodchat Shrike (*Lanius senator*) (possible breeder) (1).

Plants: No. of species 45. Ecological condition: 3 (50% disturbed).

The dominant plants: trees were *Salix sp* and *Populus euphratica*; shrubs were *Glycyrriza glabra* and *Rubus sanctus*; herbs were *Paronychia argentea* and *Foeniculum officinale* and grass were *Phragmites communis* and *Sorghum halepense*.

Fish: This site was not visited by the fisheries expert

Conservation Significance: The near-endemic species observed in winter was the Iraq Babbler (8). For summer the birds of conservation significance were the IUCN Red-listed species Egyptian Vulture (*Neophron percnopterus*), the near endemic species Iraq Babbler (*Turdoides allirostris*), Hooded Crow (*Corvus corone coronix*), and the European roller (*Coracias garrulous*).

Conservation Issues: This area is disturbed by improper usage of land for cultivation along the riparian area.

19- Doly Smaquly & Ashab Valley (E5A & E5B) - Elev. 1184m (Surveyed in summer only):

Site Description: This is a valley with some streams surrounded in the west and east by a number of mountains covered by *Quercus sp*, *Prunus sp*, and *Pistacia sp*. There is also the presence of many herbs in this area use for agriculture. A new road was constructed passing the area.



Plate 27: Doly Smaquly & Ashab Valley (E5A & E5B)

Summer Observations (28/5/2008):

Birds: Total Bird count: 289 birds. Species number: 30.

Species seen at the site include the following: Masked Shrike (*Lanius nubicus*) (possible breeder) (5), Woodchat Shrike (*Lanius senator*) (confirmed breeder) (65), Bonelli's Eagle (*Hieraaetus fasciatus*) (probable breeder) (2), Syrian Woodpecker (*Dendroscopus syriacus*) (possible breeder) (three), Sombre Tit (*Parus lugubris*) (probable breeder) (9), Eastern Rock Nuthatch (*Sitta tephronota*) (probable breeder) (10), Egyptian Vulture (*Neophron percnopterus*) (probable breeder) (2), Balckbird

(*Turdus merula*) (probable breeder) (4), Ménétries's Warbler (*Sylvia mystacea*) (probable breeder) (9), and Kestrel (*Falco tinunculus*) (possible breeder) (3).

Plants: Recorded 50 species. Ecological condition: 3 (50% disturbed)

The dominant plants: trees were *Quercus aegilops* and *Platanus orientalis*; shrubs were *Gleyrriza glabra*, *Astragalus myriacanthus* and *Capparis spinosa*; herbs were *Salvia palaestina* and *Thymbra spicata* and grasses were *Sorghum halepense* and *Aegilops crassa*. Also recorded for the first time in Kurdistan Iraq were *Euphorbia boissieriana*, *Cousinia Khorramabadensis* var. *purpurea*, *Cousinia raphiostegia*, *Outreya carduiiformis*. To note, a new genus was recorded: *Outreya carduiiformis*.

Fish: No fish were taken at this site.

Conservation Significance: There were no birds of conservation importance observed in winter. For summer birds of conservation concern were: Egyptian Vulture (*Neophron percnopterus*), Pin-tailed Sandgrouse (*Pterocles alchata*), and European Roller (*Coracias garrulus*).

Conservation Issues: Threats to the site include grazing and extensive road construction.

20-Babraka (E11) - Elev. 305m (Surveyed in winter & summer)

Site Description: This survey area is on the Great Zap River, which travels southwest through the site until it reaches the Tigris River. It is surrounded by steppes and highlands with Mt. Dara Mamz to the south. The village of Kharok is northeast of the survey area and the site is located northwest of Erbil City. There is a gravel mine at this site.



Plate 28: Bahraka (E11)

Winter Observations (1/2/2008):

Birds: Total Count: 479. Species Number: 32. Some species that were observed include: Common Shelduck (*Tadorna tadorna*) (5), Mallard (*Anas platyrhynchos*) (6), Eurasian Teal (*Anas crecca*) (18), Grey Heron (*Ardea cinerea*) (8), Great Cormorant (*Phalacrocorax carbo*) (23), Kestrel (*Falco tinnunculus*) (18), Hen Harrier (*Circus Cyaneus*) (1), Sparrowhawk (*Accipiter nisus*) (1), Steppe Buzzard (*Buteo b. vulpinus*) (6), Long-legged Buzzard (*Buteo buteo*) (8), Red Wattled Lapwing (*Vanellus indicus*) (13), Wallcreeper (*Tichodroma muraria*) (1), & Woodpigeon (*Columba palumbus*) (112).

Fish: Six (6) fish species were recorded here; all of them are native and not of conservation concern.

Habitat: A low land area covered by dry grasses, with some plants near the river such as *Tamarix* sp, *Vitex* sp, and *Prosopis* sp.

Summer Observations (29/5/2008):

Birds: Total Bird count: 496 birds. Species number: 32.

Species seen at the site include the following: Egyptian Vulture (*Neophron percnopterus*) (possible breeder) (1), Pin-tailed Sandgrouse (*Pterocles alchata*) (probable breeder) (2), European Roller (*Coracias garrulus*) (probable breeder) (42), Booted Eagle (*Aquila [Hieraaetus] pennata[pennatus]*) (non breeder) (1), Yellow Wagtail (*Motacilla flava*) (possible breeder) (3), and Olivaceous Warbler (*Hippolais pallida*) (probable breeder) (18).

Plants: Recorded 55 species. Ecological condition: 4 (75% disturbed).

The dominant plants: tree was *Salix* sp; shrub was *Tamarix gallica*; herb was *Chenopodium* sp. and grasses were *Avena fatua* and *Bromus diandrus*.

Fish: Total fish count: 7. The dominant fish species were *Chondrostoma regius* (35%), followed by *Capoeta damascina* (19%), *Alburnus mossulensis* (13%), *Cyprinun macrostomum* (11%), *Acanthobrama marmaid* (9%), *Mystus pelusius* (5%), *Silurus triostegus* (4%), and *Mastacembelus mastacembelus* (4%),

Conservation Significance: There were no birds of conservation importance observed in winter. For summer birds of conservation concern were: Egyptian Vulture (*Neophron percnopterus*), Pin-tailed Sandgrouse (*Pterocles alchata*), and European Roller (*Coracias garrulus*).

Conservation Issues: Extensive gravel mining is a threat at this site.

21- Barzan (E8) - Elev 670m (Just surveyed in summer):

Site Description: This site is a protected area located on the northeast of Erbil City which represents mountains with woodlands of Oak tree with the presence of some streams. The most important river near to this site is Barzan River which comes from Turkey through Musaka Village then it mixes the water from the Bekhal and Jundyan forming the Big Zab.



Plate 29: Barzan (E8)

Summer Observations (21/5/2008):

Birds: Total Bird count: 215 birds. Species number: 44.

Species seen at the site include the following: Long-legged Buzzard (*Buteo rufinus*) (probable breeder) (2), Booted Eagle (*Hieraaetus pennatus*) (possible breeder) (1), Hooded Crow (*Corvus corone cornix*) (probable breeder) (6), Lesser Kestrel (*Falco naumanni*) (probable breeder) (4), Masked Shrike (*Lanius nubicus*) (possible breeder) (2), Finsch's Wheatear (*Oenanthe finschii*) (possible breeder) (2), Woodchat Shrike (*Lanius senator*) (possible breeder) (3), Lesser Spotted Woodpecker (*Dendroscopus minor*) (possible breeder) (2), Common Cuckoo (*Cuculus canorus*) (possible breeder) (1), Eastern Rock Nuthatch (*Sitta tephronota*) (probable breeder) (6), Chukar (*Alectoris chukar*) (probable breeder) (5), and Griffon Vulture (*Gyps fulvus*) (probable breeder) (6).

Other Wildlife Seen: One Common Jackal (*Canis aureus*) (LC), and 24 Wild Goats (*Capra aegragrus*) (VU) were observed.

Plants: No. of species 40; Ecological condition: 3 (50% disturbed)

The dominant plants: trees were *Quercus aegilops*, *Platanus orientalis* and *Salix aegyptiaca*; shrub was *Rubus sanctus*, herbs were *Potamogeton lucencep* and *Echinops heteromorphus* and grass was *Aegilops columnaris*. Also we recorded two new species in Kurdistan Iraq for the first time: *Convolvulus betonicifolium* and *Echinops cyanocephalus*.

Fish: Total fish count: 9. Species number: 3.

The dominant fish species was *Chondrostoma regius* (45%), followed by *Alburnus mossulensis* (20), and *Barbus lacerta* (35).

Conservation Significance: Birds of conservation concern are: eastern rock Nuthatch (*Sitta tephronota*), Finsch's Wheatear (*Oenanthe finschii*), Lesser Kestrel (*Falco naumani*), European Roller (*Coracias garrulous*), Masked Shrike (*Lanius nubicus*), and Hooded Crow (*Corvus corone cornix*).

Conservation Issues: Urbanization (such as road construction) and grazing have affected some parts of this site.

22-Haji Omran (E1) - Elev 1800m (Just surveyed in summer):

Site Description: This area located on a border in the northeast of Erbil City is surrounded by a number of mountains such as Sakran in the south, Halgurd in the west and Gardamn in the north, and hills with presence of several streams and meadows also with high plant diversity which is considered one of the most important plant area in Iraq.



Plate 30: Haji Omran (E1)

Summer Observations (22/5/2008):

Birds: Total Bird count: 194 birds. Species number: 31.

Species seen at the site include the following: Starling (*Sternus vulgaris*) (probable breeder) (27), Kestrel (*Falco tinunculus*) (possible breeder) (6), Magpie (*Pica pica*) (probable breeder) (5), Rock Bunting (*Emberiza cia*) (probable breeder) (7), Rock Sparrow (*Petronia petronia*) (possible breeder) (2), Golden Oriol (*Oriolus oriolus*) (probable breeder) (11), Long-legged Buzzard (*Buteo rufinus*) (probable breeder) (2), Goldfinch (*Carduelis carduelis*) (probable breeder) (3), Lesser Grey Shrike (*Lanius minor*) (possible breeder) (1), Masked Shrike (*Lanius nubicus*) (possible breeder) (2), and Black-headed Bunting (*Emberiza melanocephala*) (probable breeder) (18).

Plants: No. of species 55. Ecological condition: 2 (25% disturbed).

The dominant plants: Trees were *Platanus orientalis* and *Salix* sp; shrub was *Asteragalus* sp; herbs were *Ranunculus repens* and *Ferulago angulata* and grass was *Scirpoides holoschoenus*. Also we recorded two (2) new species in Kurdistan Iraq for the first time: *Convolvulus betonicifolium* and *Marrubium vulgare*.

Fish: This site was not visited by the fisheries expert.

Conservation Significance: Birds of conservation concern were: Hooded Crow (*Corvus corone cornix*), Masked Shrike (*Lanius nubicus*), and Finsch's Wheatear (*Oenanthe finschii*).

Site Status & Conservation Issues: Mine fields, improper land usage by using it for cultivation has affected the original land property, urbanization such as building houses and constructing roads and grazing have affected the site.

23-Kherazook (E9) - Elev 593m (Just surveyed in summer):

Site Description: This site is located near the Turkish border. The area is bombarded daily by Turkey near the Kherazook Village. Also the Kakla River passes through the site. There are poplar farms on the west bank, also willow riparian habitat. The area is surrounded by mountains.



Plate 31: Kherazook (E9)

Summer Observations (23/5/2008):

Birds: Total Bird count: 121 birds. Species number: 33.

Species seen at the site include the following: Finsch's Wheatear (*Oenanthe finschii*) (probable breeder) (2), Golden Oriol (*Oriolus oriolus*) (probable breeder) (3), Masked Shrike (*Lanius nubicus*) (probable breeder) (3), European Bee-eater (*Merops apiaster*) (probable breeder) (9), Goldfinch (*Carduelis carduelis*) (probable breeder) (5), Kestrel (*Falco tinunculus*) (possible breeder) (4), Booted Eagle (*Hieraaetus pennatus*) (possible breeder) (1), Hooded Crow (*Corvus corone cornix*) (probable breeder) (7), and Stepe Buzzard (*Buteo b. Vulpinus*) (passage migrant) (1).

Plants: No. of species 31. Ecological condition: 4 (75% disturbed).

The dominant plants: trees were *Salix aegyptiaca* and *Plantanum orientalis*; shrub was *Rubus sanctus*, herbs were *Cephalaria syriaca*, *Potamageton nodosus* and *Cardaria draba* and herb was *Hordeum glaucum*.

Fish: Total fish count: 10. Species number: 4. The dominant fish species was *Barbus grypus* (50%), followed by *Cyprinus macrostomum* (35%), *Barbus esocinus* (10%) and *Gara rufa* (5%).

Conservation Significance: Birds of conservation concern were: Masked Shrike (*Lanius nubicus*), Finsch's Wheatear (*Oenanthe finschii*), Sombre Tit (*Parus lugubris*), and Hooded Crow (*Corvus corone cornix*).

Presence of Biz (*Barbus esocinus*) (Heckel, 1843) gives the site a high value due to the threats this fish faces in southern Iraq.

Site Status & Conservation Issues: Human activity and bombardment have an impact on this site.

24- IBA 004 - Bakhma (E7) - Elev 421m (Just surveyed in summer):

Site Description: There is a dam construction site on the Big Zap (not currently active). The Lat and Cork Mountains rise to the south of the site, and to the north and northeast are a number of hills. There is a village to the south as well; and the ridge running southeast to northwest has the gap where the dam will go. Vegetation is sparse; largely oak-steppe habitat with tamarisk visible and farming of poplar in the village.



Plate 32: Bekhma (E7)

Summer Observations (24/5/2008):

Birds: Total Bird count: 252 birds. Species number: 38.

Species seen at the site include the following: Golden Oriol (*Oriolus oriolus*) (probable breeder) (14), Syrian Woodpecker (*Dendroscopus syriacus*) (probable breeder) (4), Spotted Flycatcher (*Muscicapa striata*) (possible breeder) (7), Egyptian Vulture (*Neophron percnopterus*) (3), Eastern Rock Nuthatch (*Sitta tephronota*) (probable breeder) (5), Griffon Vulture (*Gyps fulvus*) (probable breeder)

(2), Masked Shrike (*Lanius nubicus*) (probable breeder) (3), Sombre Tit (*Parus lugubris*) (possible breeder) (3), Chukar (*Alectoris chukar*) (probable breeder) (4), European Bee-eater (*Merops apiaster*) (probable breeder) (13), and Woodchat Shrike (*Lanius senator*) (probable breeder) (3).

Plants: No. of species 55. Ecological condition: 4 (75% disturbed).

The dominant plants: Trees were *Quercus aegilops* and *Platanus orientalis*; shrubs were *Ziziphus* sp and *Tamarix gallica*; herbs were *Xanthium strumarium* and grass was *Hordium bulbosum* and *Aegilops* sp. Also we recorded two new species in Kurdistan Iraq for the first time were *Cousinia rhabdiostegia* and *Cousinia Kborramabadensis* var. *purpurea*.

Fish: Total fish count: 7. Species number: 4.

The dominant fish species was *Chondrostoma regius* (50%), followed by *Garra rufa* (25%), *Varicorhinus barroisi* (20%), and *Mastacembelus mastacembelus* (5%).

Conservation Significance: Birds of conservation concern are: Sombre Tit (*Parus lugubris*), Masked Shrike (*Lanius nubicus*), Eastern Rock Nuthatch (*Sitta tephronota*), Hooded Crow (*Corvus corone cornix*), and Collared Pratincole (*Glareola pratincola*).

Conservation Issues: Industrialization (such as gravel mining), grazing and urbanization (like constructing dam and roads) have a great impact on this site.

25- Dohuk Lake (D9) - Elev. 605m (Surveyed in winter only)

Site Description: This is a small lake about 1.5 km² located just north of Dohuk City. The lake is fed by springs from the surrounding mountains. These mountains, Garmawa and Bajlur, have moderate plant coverage. Human activity is low and this lake provides a source of drinking water for Dohuk City.



Plate 33: Dohuk Lake (D9)

Winter Observations (4/2/2008):

Birds: Total Count: 88. Species Number: 23. Some species that were observed include: Great Crested Grebe (*Podiceps cristatus*) (11), Grey Heron (*Ardea cinerea*) (9), Little Egret (*Egretta gazetta*) (2), Great Cormorant (*Phalacrocorax carbo*) (27), Kestrel (*Falco tinnunculus*) (1), Hen Harrier (*Circus cyaneus*) (1), Steppe Buzzard (*Buteo b. vulpinus*) (1), Little Owl (*Athene noctua*) (1), Eurasian Magpie (*Pica pica*) (6), Crested Lark (*Galerida cristata*) (2), Eurasian Skylark (*Alauda arvensis*) (4), Chiffchaff (*Phylloscopus collybita*) (3), Common Chaffinch (*Fringilla coelebs*) (6), European Robin

(*Eritbacus rubecula*) (4), Eurasian Blackbird (*Turdus merula*) (2), Great Tit (*Parus major*) (2), White wagtail (*Motacilla alba*) (2), Corn Bunting (*Emberiza [Miliaria] calandra*) (3), and See-see Partridge (*Ammoperdix griseogularis*) (4).

Fish: This is a protected lake with no fishing activity but indications from the previous survey suggest that many fish species exist in the lake. A special permit to assess the species in the lake would further our information of the region. By revealing the species development of a protected lake in comparison to similar unprotected habitats, government ministries and Nature Iraq could bolster their call for greater protection of fisheries.

The dominant fish species was *Alburnus mossulensis* (40%), followed by *Barbus luteus* (35%), *Cyprinion macrostomum* (15%), and *Capoeta damascina* (10%). Total fish account was ten (10).

Habitat: The lake is surrounded by a number of rocky mountains and hills. It is covered by dry grasses (Graminea Family) with a high number of herbs, shrubs and trees such as *Vitis* sp, *Pyrus communis*, *Quercus* sp, *Ficus* sp, *Prunus amygdalus*, and *Orobanche* sp.

Conservation significance: In this area no birds were seen of conservation significance.

The mussel *Anodonta* was found here. Though previously known to inhabit southern Iraqi rivers and marshes and found in a variety of substrates, including silt, sand, and grave, this is the first record of *Anodonta* in Kurdistan, northern Iraq (See K-KBA Water Quality Review 2008). Due to the occurrence of this organism, further sampling, identification, distribution, and abundance monitoring should be conducted in future surveys. Furthermore, it is economically valuable as a potential food protein source. Also, a wide variety of freshwater fish (i.e. common carp, *Cyprinus carpio*) have the clam glochidial stage, parasitic larva, encysted in their gills causing damage; another reason to monitor this organism. Also the benthic macroinvertebrate *Cladotanytarsus* was also recorded for the first time at this site as well as Bahraka, Fishkhaboor and Kalar.

Conservation Issues: This site is protected from fishing and other impacts because the lake is the water source for the city of Dohuk.

26- IBA 003 - Ser Amadia & Sulav (D2A & D2B) - Elev. 1123m (Surveyed in summer only):

Site Description: Ser Amadia (D2A) is located along the middle of three west-east mountain ridges rising to 2000m, about 20 km south of Turkish border. The Amadiya valley lies at 1,450-1550 m, 3 km west of Amadia. This site includes rocky cliffs and gorges to the south, the tree line is at 1,650m, and ridge has a grassy saddle at 1,850m. There is a *Quercus*, *Populus* and *Juniperus* forest, streams and springs among the rocks and grass.

Sulav (D2B) is an area of rocky cliffs and is the location of a small resort site. There is a spring coming from mountains to the north running to the south and there are *Juglans* trees along the stream.



Plate 34: Ser Amadia (D2A)



Plate 35: Sulav (D2B)

Summer Observations (31/5/2008):

Birds: Total Bird count: 245 birds. Species number: 41.

Species seen at the site include the following: Lesser Kestrel (*Falco naumani*) (confirmed breeder) (8), European Roller (*Coracias garrulus*) (possible breeder) (2), Kestrel (*Falco tinunculus*) (possible breeder) (2), Hooded Crow (*Corvus corone coronix*) (possible breeder) (5), Sombre Tit (*Parus*

lugubris) (possible breeder) (5), Western Rock Nuthatch (*Sitta neumayer*) (possible breeder) (5), Eastern Rock Nuthatch (*Sitta tephronota*) (probable breeder) (6), Masked Shrike (*Lanius nubicus*) (possible breeder) (3), Great Tit (*Parus major*) (probable breeder) (9), Long-tailed Tit (*Aegithalos caudatus*) (probable breeder) (12), and Eurasian Hobby (*Falco cherrug*) (confirmed breeder) (6).

Sulav (D2A) Plants: Recorded 40 species. Ecological condition: 3 (50% disturbed).

The dominant plants: trees were *Quercus infectoria* and *Juglans regia*; shrubs were *Rhus coriaria* and *Rosa galica*; herbs were *Silybum marianum* and *Nasturtium officinale* and grass was *Hordeum glaucum*. Also we recorded new species in Kurdistan-Iraq for the first time: *Colchicum kotschyi* and as well as species which are considered very rare species: *Quercus macranthera* (Townsend, C.C. and Guest, E., 1980)

Ser Amadia (D2B) plant: Recorded 55 species. Ecological condition: 3 (50% disturbed).

The dominant plants: trees were *Quercus sp.*, *Pistacia eurycarpa* and *Juniperus oxycedrus*; shrubs were *Periploca graeca* and *Paliurus spina-christi*; herbs were *Aristolochia tomentosa*, *Dianthus pendulus* and *Bryonia dioica* and grasses were *Bromus diandrus* and *Pheum exaratum*. Also we recorded a new family of shrubs in Kurdistan-Iraq for the first time: *Salvadoraceae* with three (3) species *Salvadora oleoides*, *Campanula cecilia* and *Umbilicus intermedium*.

Fish: No fish samples were taken from this site.

Conservation Significance: Key species are Lesser Kestrel (*Falco naumani*), European Roller (*Coracias garrulus*), Hooded Crow (*Corvus corone coronix*), Sombre Tit (*Parus lugubris*), Western Rock Nuthatch (*Sitta neumayer*), Eastern Rock Nuthatch (*Sitta tephronota*), Masked Shrike (*Lanius nubicus*).

Conservation Issues: New road construction, grazing and human activities have been affecting the area.

27- IBA 001 - Benavi (D6) - Elev. 1375m (Surveyed in summer only):

Site Description: The site lies at 1,500-1,700 m and includes a valley containing Benavi village and the adjacent mountain ridge. The slopes are rocky and grassy, with a rich herb flora and isolated *Quercus* shrubs and trees. The local economy depends mainly on sheep grazing.



Plate 36: Benavi (D6)

Summer Observations (1/6/2008):

Birds: Total Bird count: 182 birds: Species number: 37.

Species seen at the site include the following: Long-legged Buzzard (*Buteo rufinus*) (possible breeder) (1), Sparrowhawk (*Accipiter nisus*) (possible breeder) (1), Golden Oriol (*Oriolus oriolus*) (probable breeder) (13), Syrian Woodpecker (*Dendroscopus Syriacus*) (possible breeder) (7), Goldfinch (*Carduelis carduelis*) (probable breeder) (9), Finsch's Wheatear (*Oenanthe finschii*) (possible breeder) (1), Rouse –coloured Starling (*Sturnus roseus*) (probable breeder) (12), Western Rock Nuthatch (*Sitta neumayer*) (possible breeder) (3), Eastern Rock Nuthatch (*Sitta tephronota*) (probable breeder) (9), Sombre Tit (*Parus lugubris*) (possible breeder) (14), Hooded Crow (*Corvus corone cornix*) (possible breeder) (3), and Common Cuckoo (*Cuculus canorus*) (possible breeder) (1).

Other Wildlife Seen: The team was told later that on the 21st of June one person in this area was attacked by a Brown Bear and lost his arm.

Plants: Recorded 45 species. Ecological condition: 3 (50% disturbed).

The dominant plants: Trees were *Quercus aegilops*, *Acer monspessulanum* and *Juglans regia*; shrub was *Crataegus orientalis*; herbs were *Euphorbia sp*, *Hyoscyamus niger* and *Thymus syriacus* and grass was *Bromus danthoniae*. Also we recorded new species in Kurdistan-Iraq at first time was *Paracarum intermedium*

Fish: This is a dry site.

Conservation Significance: Birds of conservation concern are Hooded Crow (*Corvus corone coronix*), Masked Shrike (*Lanius nubicus*), Sombre Tit (*Parus lugubris*), Finsch's Wheatear (*Oenanthe finschii*), Eastern Rock Nuthatch (*Sitta tephronota*), and Western Rock Nuthatch (*Sitta neumayer*).

Conservation Issues: Moderate grazing impacted the area.

28- Sararu (D13) - Elev. 1048m (Surveyed in summer only):

Site Description: It is about 46 km northeast of Dohuk City, about 8 km² in size. It is a mountainous area with a valley including farmlands with walnuts and other trees, and a spring passing through the valley.



Plate 37: Sararu (D13)

Summer Observations (1/6/2008):

Birds: Total Bird count: 185 birds. Species number: 34.

Species seen at the site include the following: Hooded Crow (*Corvus corone coronix*) (possible breeder) (7), Kestrel (*Falco tinunculus*) (2), Lesser Kestrel (*Falco naumani*) (probable breeder) (3), Levant Sparrowhawk (*Accipiter briveps*) (possible breeder) (1), Masked Shrike (*Lanius senator*) (possible breeder) (2), Golden Oriol (*Oriolus oriolus*) (possible breeder) (2), Eastern Rock Nuthatch (*Sitta tephronota*) (probable breeder) (6), Nuthatch (*Sitta europaea*) (probable breeder) (5), Sombre Tit (*Parus lugubris*) (probable breeder) (7), Great Tit (*Parus major*) (probable breeder) (22), Blue Tit (*Parus caeruleus*) (probable breeder) (12), Black-headed Bunting (*Emberiza melanocephala*) (probable breeder) (5), Greenfinch (*Carduelis chloris*) (possible breeder) (3), Goldfinch (*Carduelis carduelis*) (probable breeder) (9), and Magpie (*Pica pica*) (possible breeder) (3).

Plants: Recorded 40 species. Ecological condition: 3 (50% disturbed).

The dominant plants: Trees were *Quercus* sp. and *Plantanum orientalis*; shrubs were *Astragalus myriacanthus* and *Crataegus* sp; herbs were *Potentilla hirta* and *Urtica urens* and grasses were *Aegilops columnaris* and *Dactylis glomerata*.

Fish: No fish survey was conducted and no fish were observed.

Conservation Significance: Birds of conservation concern were: Masked Shrike (*Lanius nubicus*), Sombre Tit (*Parus lugubris*), Lesser Kestrel (*Falco naumani*), Eastern Rock Nuthatch (*Sitta tephronota*), and Hooded Crow (*Corvus corone coronix*).

Conservation Issues: Grazing, road construction, and other human activities impacted the area.

29- Zawita (D7) - Elev. 987m (Surveyed in summer only):

Site Description: This site about 13 km northeast of Duhok City, it is highlands covered mostly by a forest of pines tree (*Pinus brutia*, which is an endemic plant, covers about 70% of this site). It is also used by people as a resort site.



Plate 38: Zawita (D7)

Summer Observations (2/6/2008):

Birds: Total Bird count: 143 birds. Species number: 29.

Species seen at the site include the following: Egyptian Vulture (*Neophron percnopterus*) (possible breeder) (3), Somre Tit (*Parus lugubris*) (possible breeder) (3), Eastern Rock Nuthatch (*Sitta tephronota*) (possible breeder) (7), Black-headed Bunting (*Emberiza melanocephala*) (probable breeder) (6), Great Tit (*Parus major*) (possible breeder) (2), Greenfinch (*Carduelis chloris*) (possible breeder) (11), European Turtle Dove (*Streptopelia turtur*) (possible breeder) (1), Goldfinch

(*Carduelis carduelis*) (probable breeder) (11), and Syrian Woodpecker (*Dendroscopus syriacus*) (possible breeder) (2).

Plants: Recorded 37 species. Ecological condition: 3 (50% disturbed).

The dominant plants: tree was *Pinus halepensis var. brutia*; shrub was *Ziziphora capitata*; herbs were *Scrophularia deserti*, *Alcaea officinalis* and *Phlomis olivieri* and grass was *Aegilops sp.* Also we recorded for the first time *Centaurea macrocephala* in Kurdistan, Iraq.

Fish: Dry site.

Conservation Significance: The endemic pinus tree (*Pinus brutia*), and birds of conservation concern were: Egyptian Vulture (*Neophron percnopterus*), Masked Shrike (*Lanius nubicus*), Sombre Tit (*Parus lugubris*), European Turtle Dove (*Streptopelia turtur*, and Eastern Rock Nuthatch (*Sitta tephronota*). This site is well known to have an endemic pine tree (*Pinus brutia*).

Conservation Issues: Human activities have the largest impact to the area. It's proximity to Duhuk allows many people to use the area for picnicking resulting to trash accumulation and potential sewage problems.

30- Mangeesh (D8) - Elev. 914m (Surveyed in summer only):

Site Description: This area is about 20 km northeast of Dohuk City and represents an area with foothills, mountains, valley, which is mostly covered by oak trees. There are also many cultivated lands. Previously this area was surveyed in two separate points (D8A & D8B). The observations for these sites are integrated here.



Plate 39: Mangeesh (D8)

Summer Observations (2/6/2008):

Birds: Total Bird count: 148 birds. Species number: 27.

Species seen at the site include the following: Lesser Kestrel (*Falco naumani*) (possible breeder) (1), Kestrel (*Falco tinnunculus*) (possible breeder) (2), White-throated Robin (*Irania gutturalis*)

(probable breeder) (7), Short-toed Eagle (*Circaetus gallicus*) (possible breeder) (3), Golden Oriol (*Oriolus oriolus*) (probable breeder) (3), Olivaceous Warbler (*Hippolais pallida*) (possible breeder) (9), Western Rock Nuthatch (*Sitta neumayer*) (possible breeder) (1), eastern Rock nuthatch (*Sitta tephronota*) (possible breeder) (3), Masked Shrike (*Lanius nubicus*) (probable breeder) (5), Spotted Flycatcher (*Muscicapa striata*) (possible breeder) (5), and Magpie (*Pica pica*) (possible breeder) (1).

Plants: Recorded 50 species. Ecological condition: 4 (75% disturbed).

The dominant plants: tree was *Quercus sp*; shrubs were *Vitis vinifera* and *Rubus sanctus*; herb was *Acanthus dioscorides* and grass was *Avena fatua*. We recorded *Phlomis herba-venti* in Kurdistan for the first time.

Fish: This is a dry site.

Conservation Significance: Birds of conservation concern are: Lesser Kestrel (*Falco naumani*), Masked Shrike (*Lanius nubicus*), White-throated Robin (*Irania gutturalis*), Western Rock nuthatch (*Sitta tephronota*), and Eastern Rock Nuthatch (*Sitta tephronota*).

Conservation Issues: Human activity from agriculture, building of houses and road construction are impacting the site.

31- Atrush (D3) - Elev. 628m (Surveyed in summer only):

Site Description: It is about 19 km east of Duhok City. This area has a diverse habitat including a gorge and open land that is covered mostly by Poplar trees, and surrounded by foothills with the existence of houses near the stream which passes the area.



Plate 40: Atrush (D3)

Summer Observations (3/6/2008):

Birds: Total Bird count: 220 birds. Species number: 30.

Species seen at the site include the following: Lesser Kestrel (*Falco naumani*) (possible breeder) (1), Kestrel (*Falco tinnunculus*) (possible breeder) (3), Long-legged Buzzard (*Buteo rufinus*) (possible breeder) (1), Egyptian Vulture (*Neophron percnopterus*) (possible breeder) (1), European Roller (*Coracias garrulus*) (probable breeder) (16), Hooded Crow (*Corvus corone coronix*) (possible breeder) (7), Eastern Rock Nuthatch (*Sitta tephronota*) (possible breeder) (11), Great Tit (*Parus major*) (probable breeder) (8), Golden Oriol (*Oriolus oriolus*) (probable breeder) (4), and Spotted Flycatcher (*Muscicapa striata*) (possible breeder) (2).

Plants: Recorded 66 species. Ecological condition: 4 (75% disturbed).

The dominant plants: Trees were *Quercus* sp, *Salix acmophylla* and *Plantanum orientalis*; shrubs were *Rubus sanctus* and *Ziziphora capitata*; herbs were *Alcea kurdica* and *Michauxia* sp and grass was *Imperata cylindrica*. Also we recorded new species in Kurdistan Iraq for the first time: *Scleria ciliate* and *Stachys kermanshabensis*, a new genus was recorded for the first time *Scutellaria tournefortii*.

Fish: Total fish count: 22. Species number: 7.

The dominant fish species was *Alburnus mossulensis* (30%), follow by *Cyprinus macrostomum* (18%), an unidentified fish (17%), *Capoeta damascina* (10%), *Leuciscus berak* (11%), *Varicorhinus* sp. (8%) and *Barbus esocinus* (6%).

Conservation Significance: Key species were: Lesser Kestrel (*Falco naumani*), Egyptian Vulture (*Neophron percnopterus*), Hooded Crow (*Corvus corone coronix*), and Eastern Rock Nuthatch (*Sitta tephronota*).

Presence of Biz (*Barbus esocinus*) (Heckel, 1843) gives this site high value because it is considered a sensitive native and threatened fish species. The diversity of fish species is very good so this area needs more conservation care as a protected area for fisheries.

Conservation Issues: Grazing, road construction and human activities resulting from the area being used for picnicking and resort activities adversely impact this site.

32- Fishkhaboor-Syrian Border (D11A) - Elev. 327m (Surveyed in winter & summer)

Site Description: This site is located on the Tigris River on the Iraq-Syria border, northwest of Dohuk City. The site is surrounded by foothills on the west side and gravel mines to the east. A pontoon bridge crosses the river connecting to the Syrian border crossing. There is also a new bridge that is not finished yet (this was not seen in the past summer).



Plate 41: Fishkhaboor-Syrian Border (D11A)

Winter Observations (2/5/2008):

Birds: Total Count: 923. Species Number: 36. Some species that were observed include: Black Francolin (1), Ruddy Shelduck (6), Mallard (172), Eurasian Teal (70), Great Crested Grebe (6), Grey Heron (2), Great White Egret (3), Little Egret (2), Great Cormorant, Kestrel (1), Steppe Buzzard (1), Coot (4), Lapwing (4), Redshank (7), Greenshank (2), Armenian Gull (35), Great Black-headed Gull (3), Black-headed Gull (24), Wood Pigeon (450), White-throated Kingfisher (1), Pied Kingfisher (2), & Eurasian Magpie (21).

Fish: Due to a shortage in fishing tools and a lack of fisherman on site, no fish samples or interviews were obtained.

Habitat: This is a lowland area surrounded by a number of hills with agricultural practices present. It is covered by different types of plants such as *Xanthium strumarum*, *Phragmites* sp, *Tamarix* sp, *Lactuca* sp, and *Cuscuta* sp.

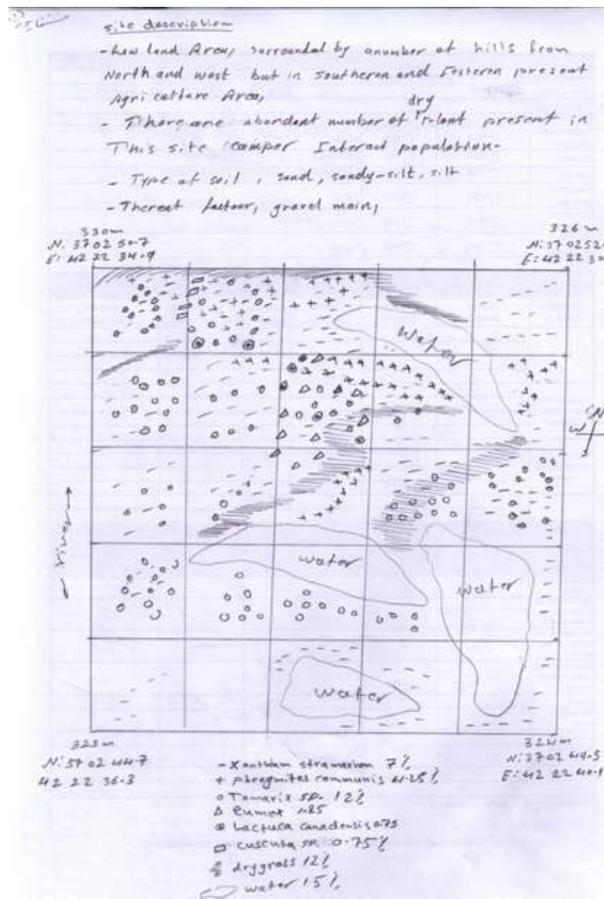


Plate 42: HHA Map of Fishkhaboor Site A

Summer Observations (6/6/2008):

Birds: Total Bird count: 1751 birds: Species number: 36.

Species seen at the site include the following: Short-toed Eagle (*Circaetus gallicus*) (possible breeder) (1), European Turtle Dove (*Streptopelia turtur*) (possible breeder) (4), European Roller (*Coracias garrulus*) (probable breeder) (3), European Bee-eater (*Merops apiaster*) (probable breeder)

(21), Blue-cheeked Bee-eater (*Merops [superciliosus] persicus*) (probable breeder) (11), Yellow Wagtail (*Motacilla flava*) (possible breeder) (1), Black-headed Bunting (*Emberiza melanocephala*) (probable breeder) (24), Eurasian Hoopoe (*Upupa epops*) (possible breeder) (4), Magpie (*Pica pica*) (probable breeder) (20), Great Reed Warbler (*Acrocephalus arundinaceus*) (possible breeder) (9), Collared Pratincole (*Glareola pratincola*) (probable breeder) (8), Dead Sea Sparrow (*Passer moabiticus*) (confirmed breeder) (1400), and Olivaceous Warbler (*Hippolais pallida*) (possible breeder) (5).

Plants: Recorded 11 species. Ecological condition: 5 (100% disturbed).

The dominant plants: trees were *populus euphratica* and *Salix acmophylla*; shrub was *Tamarix gallica*; herbs were *Datura stramonium* and *Verbascum mucronatum* and grass was *Lolium temulentum*. Also we recorded two new species in Kurdistan for the first time: *Centaurea pseudosinaica* and *Brassica kaberi*.

Fish: Total fish count: 10. Species number: 5.

The dominant fish species was *Liza abu* (35%), followed by *Cyprinus macrostomum* (25%), *Alburnus mossulensis* (18%), *Cyprinion kias* (12%), and *Garra rufa* (10%).

Conservation Significance: One bird of conservation important was seen at this site during winter observations, the Armenian Gull (35). In summer, the key species were: Collared Pratincole (*Glareola pratincola*), European Turtle Dove (*Streptopelia turtur*), European Roller (*Coracias garrulus*), and Dead Sea Sparrow (*Passer moabiticus*). This site is the second site where *Cyprinion kias* was recorded (it was also recorded in Mosul Lake).

This site D11A provided the first evidence of the bivalve, *Unio* in Kurdistan, northern Iraq (seen in winter, see K-KBA Water Quality Review – 2008), therefore further sampling, identification, distribution, and abundance studies for this organism should be conducted in future surveys. Previous surveys provide evidence of the species *Unio tigridis* in the shallow, sparsely vegetated southern Iraq waterbodies; its greatest density was seen in the slowly flowing water of the channels within the marshes.

The Clubtail dragonfly, *Stylurus* sp. (see above reference), was identified in winter only to the genus level, due to a lack of species-level references. Additional species level sampling, identification, distribution, and abundance studies should be conducted in future surveys. A vital consideration is this genus contains many species of special concern, like Russet-tipped clubtail (*Stylurus plagiatus*) which is demonstrably secure globally, Laura's clubtail (*Stylurus laurae*) apparently secure globally, and both elusive clubtail (*Stylurus notatus*) and Townes' clubtail (*Stylurus townesi*) either very rare and/or found locally in a restricted range (21 to 100 occurrences.) Furthermore, the arrow clubtail (*Stylurus spiniceps*) is a threatened species, while the zebra clubtail (*Stylurus scudderii*) and Riverine Clubtail (*Stylurus amnicola*) are endangered species.

Conservation Issues: This area is highly impacted by gravel mining.

33- Fishkhaboor-Turkish Border (D11B) - Elev. 348m (Surveyed in winter & summer)

Site Description: The site is located on the Fishkhaboor River (prior to its junction with the Tigris River entering from Turkey) further north from D11A on the Iraq-Turkey border north of the town of Zakho. The area nearest the river is somewhat flat, but surrounded with foothills and distant high mountains. There is moderate plant coverage and some cultivated lands.



Plate 43: Fishkhaboor-Turkish Border (D11B)

Winter Observations (2/5/2008):

Birds: See Site D11A

Habitat: Near the river there are plant communities of both wild and cultivated species. The most important being: *Alhaje* sp, *Ziziphus* sp, *Phragmites communes*, *Prosopis* sp, and *Plantanum orientalis*.

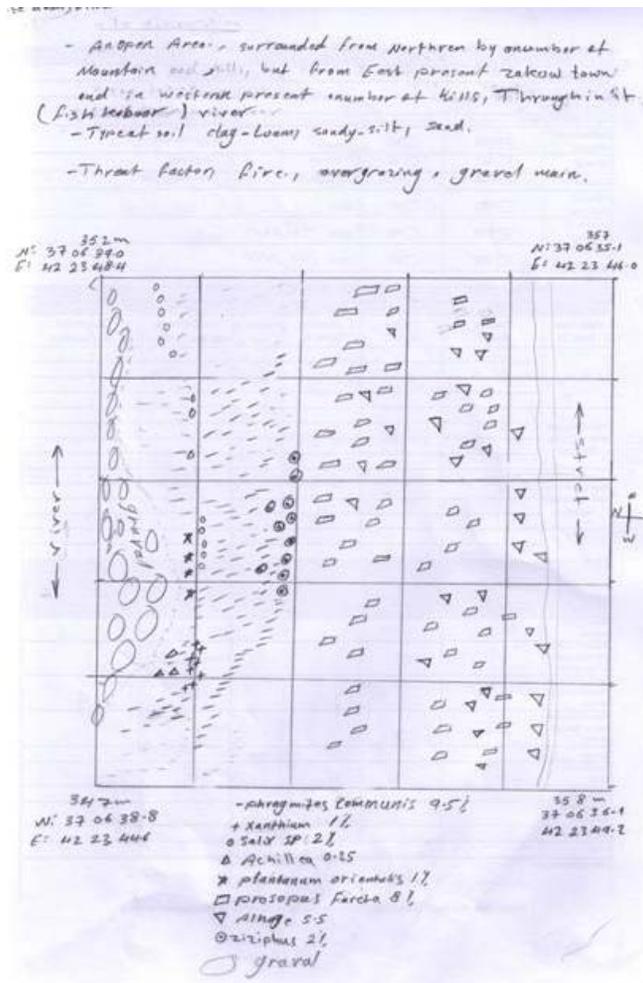


Plate 44: HHA Map of Fishkhaboor Site B

Summer Observations (6/6/2008):

Birds: See Site D11A.

Plants: Recorded 30 species. Ecological condition: 4 (75% disturbed)

The dominant plants: Tree was *Salix aegyptiaca*; shrub was *Nerium oleander*; herbs were *Prosopis farcta* and grasses were *Sorghum halepense* and *Phragmites communis*, we recorded the rare species *Typha lugdunensis* (Townsend and Guest, 1985, p213) for the first time in Kurdistan.

Fish: Total fish count: 19. Species number: 4.

The dominant fish species were *Chondrostoma regius* (60%), followed by *Cyprinus macrostomum* (20%), *Acanthobrama marmaid* (10%), and *Alburnus mossulensis* (10%).

Conservation Status: The Grappletail Dragonfly, *Octogomphus* sp., is a predator usually found in warm mountain streams, where the larvae live in loose detritus that collects in creek pools. The identification of this organism at the species level could not be completed due to lack of dragonfly identification references. This species could be *Octogomphus specularis*, which is known worldwide of higher conservation priority and its Global rank is G4 (red list). This site provides the first record of *Apedilum* sp. and *Micropsectra* sp. in Iraq, thus further sampling should take into account of their species level identification, distribution, and abundance. For more information, see the K-KBA Water Quality Review – 2008.

34- Mosul Lake (D10) - Elev 311m (winter) & 315m (summer)

Site Description: This is a large freshwater lake located southwest of Dohuk City. There is low human activity with some fishing done by net. This site is located near the water station which distributes water from the lake to Dohuk City.



Plate 45: Mosul Lake (D10)

Winter Observations (2/6/2008):

Birds: Total Count: 9852. Species Number: 37. Some species that were observed include: Ruddy Shelduck (*Tadorna ferruginea*) (9000), Greylag Goose (*Anser anser*) (52), Lesser White-Fronted Goose (*Anser erythropus*) (6), Greater White-Fronted Goose (*Anser albifrons*) (2), Eurasian Teal (*Anas crecca*) (55), Great Crested Grebe (*Podiceps cristatus*) (2), Black-necked Grebe (*Podiceps nigricollis*) (4), Grey Heron (*Ardea cinerea*) (45), Great Cormorant (*Phalacrocorax carbo*) (110), Coot (*Fulica atra*) (15), Red-Wattled Lapwing (*Vanellus indicus*) (7), Armenian gull (*Larus armenicus*) (240), Yellow-legged Gull (*Larus michabellis*) (16), Pied Kingfisher (*Ceryle rudis*) (3), Eurasian

Magpie (*Pica pica*) (3), Hooded Crow (*Corvus corone cornix*) (9), Crested Lark (*Galerida cristata*) (8), Eurasian Skylark (*Alauda arvensis*) (15), Starling (*Sturnus vulgaris*) (40), & Golden Eagle (*Aquila chrysaetos*) (1).

Fish: Twelve (12) fish species were recorded; one of the fish recorded here was *Alburnus caeruleus* which had previously been found just at site S1 (Darbendikhan Lake). There is a high possibility of finding more fish species at this site due to positive conditions that support healthy fish assemblages. A greater study of this area is required particularly when security improves.

The dominant fish species was *Liza abu* (25%), followed by *Barbus grypus* (20%), *Cyprinus carpio* (10%), *B. esocinus* (9%), *Alburnus caeruleus* (7%), *Acanthobrama marmaid* (6%), *Capoeta damascina* (6%), *B. xanthopterus* (5%), *Carassius carassius* (4%), *Mastacembelus mastacembelus* (3%), *Silurus triostegus* (3%), and *Heteropneustes fossilis* (2%), total fish account was (46 fish).

Habitat: Some typical plants found around the lake include *Carthamus* sp, *Prosopis* sp and *Centurea* sp.

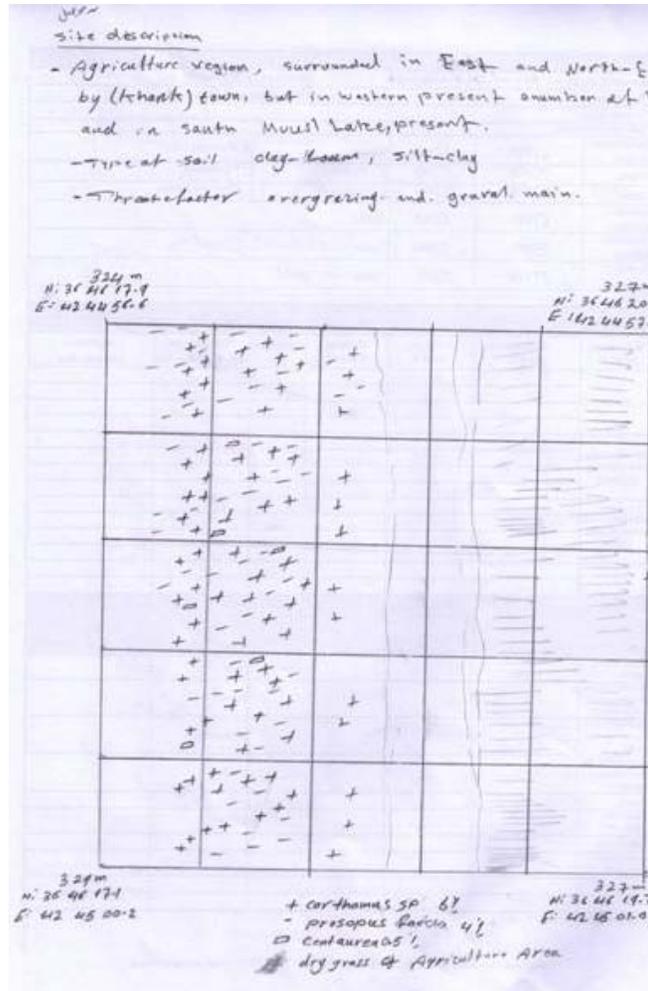


Plate 46: HHA Map of Mosel Lake

Summer Observations (4/6/2008):

Birds: Total Bird count: 2906 birds. Species number: 24.

Species seen at the site include the following: Collared Pratincole (*Glareola pratincola*) (confirmed breeder) (870), Armenian Gull (*Larus armenicus*) (possible breeder) (2), Black-headed Gull (*Larus ridibundus*) (possible breeder) (1), Slender-billed Gull (*Larus genei*) (confirmed breeder) (630), Pin-tailed Sandgrouse (*Pterocles alchata*) (probable breeder) (2), European Roller (*Coracias garrulus*) (possible breeder) (2), Sedge Warbler (*Acrocephalus schoenobaenus*) (possible breeder) (1), Little Tern (*Sterna albifrons*) (confirmed breeder) (200)

Plants: Recorded 26 species. Ecological condition: 4 (75% disturbed).

The dominant plants: Shrubs were *Capparis spinosa* and *Prosopis farcta*; the herb was *Alhagi maurorum* and the grass was *Aegilops* sp.

Fish: Total fish count: 51. Species number: 13.

The dominant fish species was *Liza abu* (17%), followed by *Cyprinus carpio* (12%), *Cyprinion macrostomum* (12%), *Barbus grypus* (12%), *Barbus esocinus* (9%), *Carassius carassius* (8%), *B. xanthopterus* (7%), *Acanthobrama marmaid* (6%), *Alburnus caeruleus* (5%), *Cyprinion kias* (4%), *Silurus triostegus* (3%), *Mastacembelus mastacembelus* (3%) and *Heteropneustes fossilis* (2%).

Conservation Significance: Approximately five (5) Lesser White-Fronted Geese were observed in winter 2008, which is a globally threatened species; also Ruddy Shelduck (9000) were seen.

For summer birds of conservation significance were: Collared Pratincole (*Glareola pratincola*), Armenian Gull (*Larus armenicus*), Slender-billed Gull (*Larus genei*), Pin-tailed Sandgrouse (*Pterocles alchata*), and European Roller (*Coracias garrulus*).

During the survey of this site (D11B,) as well as Dohuk Lake, it was the first opportunity to record the benthic chironomid species, *Chironomini* sp. (7) in Iraq. However, further sampling and identification should be continued for this organism in the coming surveys (See the K-KBA Water Quality 2008 report).

One of three large lakes in Kurdistan, northern Iraq, Mosul lake is a very important site for fish. Biz (*Barbus esocinus*); *B. grypus* and *B. Xanthopterus* were recorded here as in Dukan & Darbandikhan. These species have become almost completely absent in southern Iraq. Thus Mosul along with the other Kurdistan lakes are an important refugia for these fish species as these may serve as a stock to re-inject this native fish again into southern Iraq as part of rehabilitation efforts to restore the Iraqi marshlands.

Conservation Issues: There is hunting pressure on birds in Mosul Lake. Also the presence of the worms *Tubifex* sp., with high density at D10A, indicates organic pollution. There is a fishery on the lake and the environmental police play an active role at least in the area under the jurisdiction of Dohuk. For further information see the K-KBA Water Quality Review -2008.

This is the first record of *Dreissena polymorpha* in Iraq and future ecological studies should consider this organism. The presence of the zebra mussel in Mosul Lake should be taken into account by the Iraqi Ministry of Environment and the Iraqi Ministry of Water Resources. This species is known worldwide to be problematic, because it adheres to raw water intake systems and city water supplies, affecting the operation of municipal and other facilities, as well as impacting the natural balance of aquatic ecosystems. It can filter water thereby feeding on phytoplankton and compete with other organisms for food and space. For further information see the K-KBA Water Quality Review -2008.

This area is impacted by gravel mining.

35- Garagu (D5) - Elev. 1028m (Surveyed in summer only):

Site Description: It is about 36 km northeast of Duhok City representing a gorge (resort) with stream that passes the gorge, also rocky slopes and mountain covered by oak forest mostly and few of *Platanus* downstream.



Plate 47: Garagu (D5)

Summer Observations (5/6/2008):

Birds: Total Bird count: 183 birds: 34.

Species seen at the site include the following: Lesser Kestrel (*Falco naumani*) (confirmed breeder) (6), Kestrel (*Falco tinnunculus*) (possible breeder) (2), Steppe Buzzard (*Buteo b. vulpinus*) (passage migrant) (1), Syrian Woodpecker (*Dendroscopus syriacus*) (possible breeder) (3), Woodchat Shrike (*Lanius senator*) (possible breeder) (6), Golden Oriol (*Oriolus oriolus*) (probable breeder) (2), Hooded Crow (*Corvus corone coronix*) (possible breeder) (4), Western Rock nuthatch (*Sitta neumayer*) (possible breeder) (5), Eastern Rock Nuthatch (*Sitta tephronota*) (possible breeder) (18), Olivaceous Warbler (*Hippolais pallida*) (possible breeder) (12), Goldfinch (*Carduelis carduelis*) (probable breeder) (14), and Grey Wagtail (*Motacilla cinerea*) (possible breeder) (7).

Plants: Recorded 60 species. Ecological condition: 2 (25% disturbed).

The dominant plants: trees were *Quercus aegilops* and *Plantanum orientalis*; shrub was *Rosa sp*; herbs were *Rumex hastatulus* and *Acanthus dioscoridus* and grasses were *Hordeum glaucum* and *Agropyron panormitanus*. Also we recorded new species in Kurdistan Iraq at first time was *Aubrieta parviflora*; Recorded rare species was *Rubus caesius* (Townsend and Guest, 1966, p120) and very rare species was *Linum velutinum* (Townsend and Guest, 1980, p281)

Fish: This is a dry site.

Conservation Significance: Key species were: Lesser Kestrel (*Falco naumani*), Hooded Crow (*Corvus corone coronix*), Western Rock Nuthatch (*Sitta neumayer*), and Eastern Rock Nuthatch (*Sitta tephronota*).

Conservation Issues: This area is used as a resort, so it is impacted by human activities also by grazing.

36- Kalakchi (D12A) - Elev. 335m (Surveyed in winter & summer)

Site Description: It is an arid and flat area to the southeast of Duhok Governorate between Dohuk City and Akre. There is agricultural land with herbaceous plants and sheep grazing. To the east there is a village called Mezzal. Also there are gravel mines located on the north side of the survey site along with some water bodies such as ponds and streams.



Plate 48: Kalakchi (D12A)

Winter Observations (7/2/2008):

Birds: Total Count: 165. Species Number: 23. Some species that were observed include: Corn Bunting (*Emberiza [Miliaria] calandra*) (22), Water Pipit (*Anthus spinoletta*) (18), White Wagtail (*Motacilla alba*) (3), House Sparrow (*Passer domesticus*) (8), Starling (*Sturnus vulgaris*) (34), Eurasian Stonechat (*Saxicola torquatus (S. rubicola)*) (2), Graceful Pirinia (*Prinia gracilis*) (5), Eurasian Skylark (*Alauda arvensis*) (14), Eurasian Teal (*Anas crecca*) (7), and Mallard (*Anas platyrhynchos*) (12).

Other Wildlife Seen: A single Common Jackal (*Canis aureus*) (LC) was seen at the site.

Habitat: An important agricultural area (formerly steppe ecosystem) with a small pond present. It is covered by a number of plants such as *Typha* sp, *Juncus* sp, *Mentha* sp and *Rumex* sp.

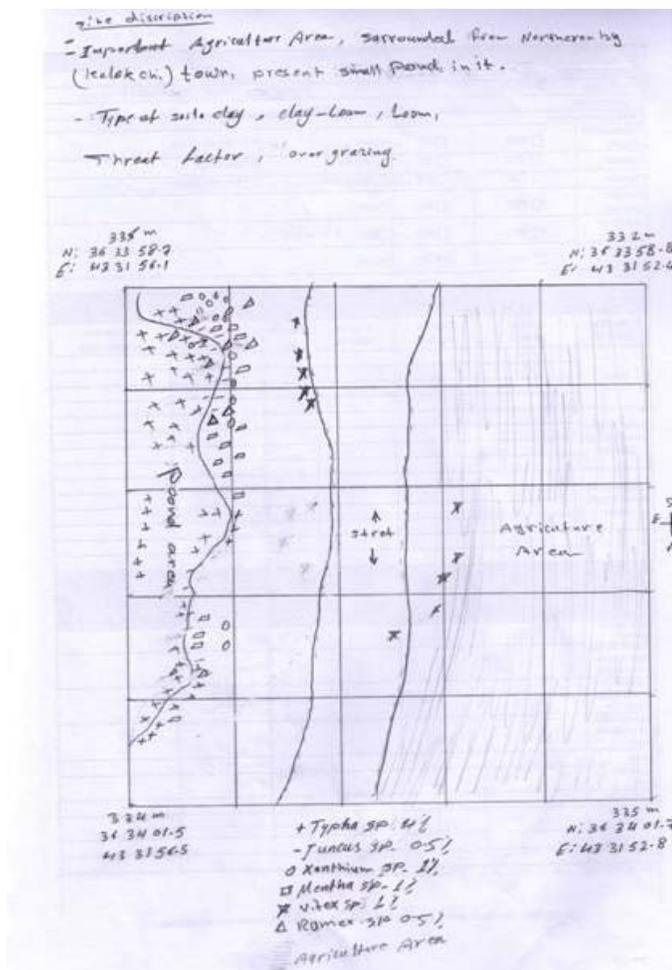


Plate 49: HHA Map of Kalachi Area

Summer Observations (8/6/2008):

Birds: Total Bird count: 135 birds. Species number: 27.

Species seen at the site include the following: Little Bittern (*Ixobrychus minutus*) (possible breeder) (15), Squacco Heron (*Ardeola ralloides*) (possible breeder) (6), Kestrel (*Falco tinnunculus*) (possible breeder) (1), Moorhen (*Gallinula chloropus*) (possible breeder) (23), Red-wattled Plover (*Hoplopterus indicus*) (probable breeder) (15), Collared Pratincole (*Glareola pratincola*) (probable breeder) (3), Pin-tailed Sandgrouse (*Pterocles alchata*) (probable breeder) (10), European Roller (*Coracias garrulus*) (probable breeder) (10), White-throated Kingfisher (*Halcyon smyrnensis*) (possible breeder) (2), Common Kingfisher (*Alcedo atthis*) (possible breeder) (1), Pied Kingfisher (*Ceryle rudis*) (probable breeder) (6), Magpie (*Pica pica*) (probable breeder) (6), and Goldfinch (*Carduelis carduelis*) (probable breeder) (21).

Plants: Recorded 34 species. Ecological condition: 3 (50% disturbed).

The dominant plants: tree was *Populus alba*; shrubs was *Vitex pseudo-negundo*; herbs *Anchusa italica* and *Cichorium intybus v. album* and *Potamogeton nodosus*; and grass was *Juncus effusus*.

Fish: This is a dry site.

Conservation significance: No birds of conservation significance were seen at the site in winter. Birds of conservation significance seen in summer were: European Roller (*Coracias garrulus*), Collared Pratincole (*Glareola pratincola*), and Pin-tailed Sandgrouse (*Pterocles alchata*).

Conservation Issues: This site is highly impacted by gravel mining and improper use of sewage water for agricultural irrigation.

37-Khazar (D12B) - Elev. 374m (Surveyed in winter & summer)

Site Description: Located at the southeast of Duhok this area is used for agriculture. To the east of the survey site there is a road while the main road is to the south. The village of Zenswae Sare is located to the north and there is a stream traveling southwest and a man-made irrigation channel which travels to the southeast.



Plate 50: Khazar (D12B)

Winter Observations (7/2/2008):

Birds: Total Count: 121. Species Number: 8. Some species that were observed include: Great White Egret (*Egretta alba*) (1), Kestrel (*Falco tinnunculus*) (1), Steppe Buzzard (*Buteo b. vulpinus*) (1), Red-Wattled Lapwing (*Vanellus indicus*) (3), Collared Dove (*Streptopelia decaocto*) (7), Crested Lark (*Galerida cristata*) (42), Eurasian Skylark (*Alauda arvensis*) (50), & Corn Bunting (*Emberiza [Miliaria] calandra*) (16).

Habitat: This agricultural area has a few streams flowing through the region used for irrigation. The survey site is covered by *Phragmites communes*.

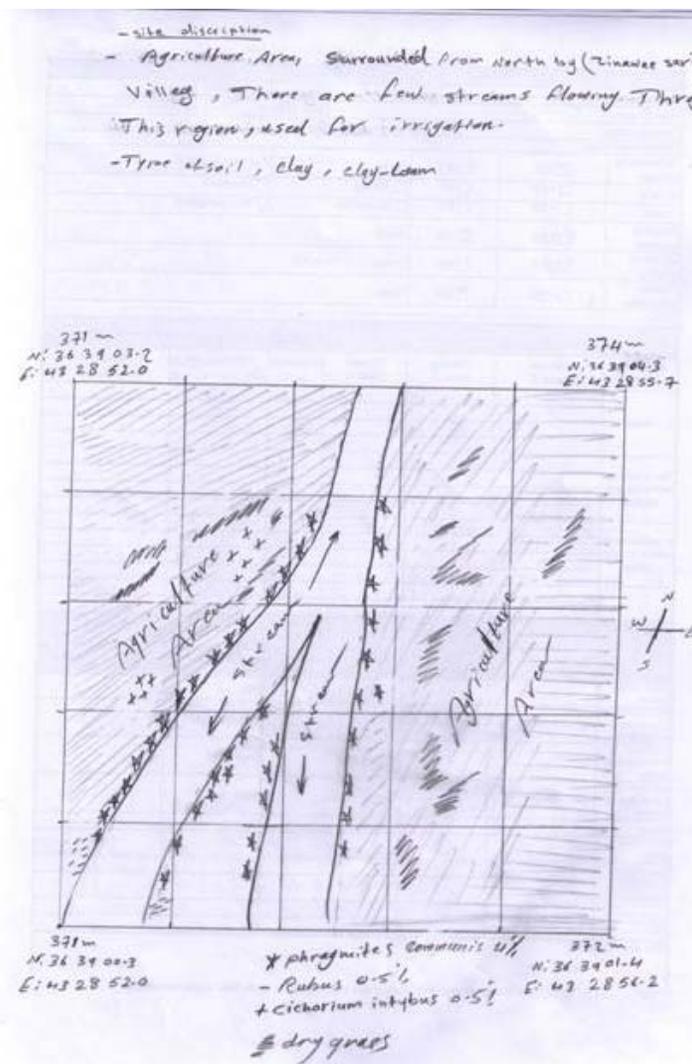


Plate 51: HHA Map of Khazar

Summer Observations (8/6/2008):

Birds: Total Bird count: 32 birds. Species number: Nine

Species seen at the site include the following: Kestrel (*Falco tinnunculus*) (possible breeder) (1), White Stork (*Ciconia ciconia*) (confirmed breeder) (8), Red-wattled Plover (*Hoplopterus indicus*) (probable breeder) (3), Pin-tailed Sandgrouse (*Pterocles alchata*) (probable breeder) (2), European Bee-eater (*Merops apiaster*) (probable breeder) (five), Barn Swallow (*Hirundo rustica*) (possible breeder) (2), European Roller (*Coracias garrulus*) (probable breeder) (one), Crested Lark (*Galerida cristata*) (possible breeder) (3), and Common Swift (*Apus apus*) (possible breeder) (7).

Plants: Recorded 10 species. Ecological condition: 4 (75% disturbed)

The dominant plants: trees were *Phragmites communis* and *Capparis spinosa*; herbs were *Centaurea pseudosinaica*, *Hyoscyamus niger* and *Carthamus* sp.

Fish: This is a dry site.

Conservation significance: No bird species of conservation significance were seen in winter. For summer the key species were: Pin-tailed Sandgrouse (*Pterocles albata*) and European Roller (*Coracias garrulus*).

Conservation Issues: This site was affected by improper land usage and human activities.

38- Gali Zanta & Garbeesh Mountain (D1A & D1B) - Elev. 374m (Surveyed in summer only):

Site Description: This is a mountainous area 85 km east of the Duhok City, with existing springs passing the area. There is also a deciduous oak forest that covers the area.



Plate 52: Gali Zanta (D1A)



Plate 53: Garbeesh (D1B)

Summer Observations (8/6/2008):

Birds: Total Bird count: 188 birds. Species number: 26.

Species seen at the site include the following: Kestrel (*Falco tinnunculus*) (possible breeder) (5), Short-toed Eagle (*Circaetus gallicus*) (possible breeder) (2), Long-legged Buzzard (*Buteo rufinus*) (possible breeder) (2), Egyptian Vulture (*Neophron percnopterus*) (possible breeder) (2), Booted Eagle (*Aquila [Hieraaetus] pennata[pennatus]*) (possible breeder) (1), European Roller (*Coracias garrulus*) (probable breeder) (5), Masked Shrike (*Lanius nubicus*) (possible breeder) (1), Woodchat Shrike (*Lanius senator*) (possible breeder) (5), Hooded Crow (*Corvus corone coronix*) (possible breeder) (2), Eastern Rock Nuthatch (*Sitta tephronota*) (possible breeder) (11), Finsch's Wheatear (*Oenanthe finschii*) (possible breeder) (2), Cinereous Bunting (*Emberiza cineracea*) (probable breeder) (23), and Goldfinch (*Carduelis carduelis*) (probable breeder) (16).

Gali Zanta (D1A) Plants: Recorded 25 species. Ecological condition: 3 (50% disturbed)

The dominant plants: trees were *Pistacia eurycarpa* and *Quercus sp*; shrubs were *Anagyris foetida* and *Prunus orientalis*; herbs were *Adiantum capillusveneris* and *Dianthus pendulus*.

Garbeesh Mountain (D1B) Plants: Recorded 15 species. Ecological condition: 4

The dominant plants: tree was *Juglans regia*; shrubs were *Rubus sanctus*; herbs were *Cichorium intybus v. album* and *Verbascum blattaria*.

Fish: Total fish count: 5. Species number: 3.

The dominant fish species was *Alburnus mossulensis* (45%), followed by *Cyprinus macrostomum* (35%), and *Garra rufa* (20%).

Conservation Significance: Key species are the two IUCN Red-listed species: Egyptian Vulture (*Neophron percnopterus*) and Cinereous Bunting (*Emberiza cineracea*), also other birds of conservation were found like: Masked Shrike (*Lanius nubicus*), European Roller (*Coracias garrulus*), Eastern Rock Nuthatch (*Sitta tephronota*), and Finsch's Wheatear (*Oenanthe finschii*).

Conservation Issues: Urbanization (like road construction) has been affecting the area. This site is also impacted by grazing.

Summary & Conclusions

Kurdistan, Northern Iraq is located inside the Irano-Tauranian region (Irano-Anatolian Sub-region) in the southeast of the western Palearctic biogeographical realm (see the plate below). The area is comprised mainly of the mountainous areas of inner Anatolia and Armenia, the Iranian mountain plateau, and the greater part of Transcaspia. The first volume of the Flora of Iraq (Guest, 1966) provides the following information on the Kurdistan area (showed in the Plate below) of the Irano-Tauranian region. Physiographically, this sub-region is highly differentiated: high mountain ranges with snow-covered peaks reaching an elevation of over 3500 m alternate with plains of varying altitude and extensive poorly-drained valleys. Although the greater part of the sub-region do not have more than 300 mm of annual precipitation, on some of the mountain slopes rainfall may approach 1500 mm or more. The diversity in topography gives rise to a gamut of local conditions, reflected in the flora and vegetation. Floristically this sub-region is not only one of the richest in number of species and genera, but also the most active in the formation of species. The great majority of Irano-Turanian endemic species are confined to the Irano-Anatolian Sub-region: there are also a comparatively high number of generic endemics. Vegetationally, the sub-region is rich in physiognomic types: forests, steppes, tragacanthic formations, halophytic and psammophytic vegetation-all may be found there.



Plate 54: Irano-Anatolian Sub-region (Original map by Conservation International)

Sites Important to Birds

The surveyed area (Kurdistan, Northern Iraq) has many types of water bodies including reservoirs, rivers, streams, springs, and some marshlands. This diversity of habitat types provides suitable conditions for many kinds of birds. More than 100 bird species breed in this area and many birds use the area for wintering or as a staging or stopping point along their migration path through the area.

The three big wetlands are Dukan Reservoir (the Dukan Dam was completed in 1959), Mosul Reservoir (Mosul Dam was completed in 1983), and Darbandikhan Reservoir (the Darbandikhan Dam was completed in 1961). The construction of these dams has been one of the key anthropological factors that have changed and impacted the diversity, migration route and time of the migration for birds in the region. Two of them (Dukan and Darbandikhan along with an unfinished dam site at Bekhma) were defined by Evans (1994) as IBA sites (IBA 004). Furthermore, Nature Iraq surveys indicate that all three reservoirs should be listed as Key Biodiversity Areas with Darbandikhan (S1) and Dukan (S2) Lakes meeting categories one, two and three of the KBA criteria (these sites regularly support globally threatened species, birds congregate in important numbers at the sites, either when breeding or on passage, or in winter, and the sites are important for species which are threatened or declining throughout all or large parts of their range in the Middle East). Mosul Lake (D10) matches the KBA categories one and two.

Altun Kopri marshland is another important KBA site because there are a significant number of birds congregating at this wetland. The following is a list of other important areas holding globally threatened species and/or species which are threatened or declining throughout all or large parts of their range in the Middle East, as well as holding species that are restricted wholly or largely to the Middle East: Gali Zanta and Garbeesh Mountain (D1) Ser Amadia (D2), Atrush (D3), Benavi (D6), Zawita (D7), Mangesh (D8), Fishkhaboor (D11), Sararu (D13), Haji Omran (E1), Smaquli and Ashab Valley (E5), Taq Taq (E6), Bakhma (E7), Barzan (E8), Kherazook (E9), Bahrka (E11), Kalar (S3), Ahmad Awa (S4A), Hawraman (S4B), Penjween (S5), Peramagroon (S6), Sargalu (S7), Chamchamal (S9), Chami Razan (S10), Qara Dagh (S11), and Sharbazher (S13)

The remained sites: Kalakchi (D12), Dohuk Lake (D9), Turaq Steppe (E4), Aski Kalak (E10), Sangaw (S14) did not match KBA criteria for bird species.

Sites Important to Plants

Some plants such as *Typha* sp, *Phragmites communes*, *Quercus* sp *Tamarix* sp, *Vitex* sp, *Prosopis* sp, *Rubus* sp, *Xanthium strumarium*, *Morus* sp, etc. are present in most sites. However a few species such as: *Equisetum* sp, *Thymus syriacus*, *Rosa foetida*, *Trachomitum venetum subsp. Sarmatiense*, *Agrimonia eupatoria* and *Dionysia* sp are only occasionally found in some locations. Nature Iraq recorded a family *Salvadoraceae* with three genres (*Outreya*, *Salvadora* and *Scutellaria*) for the first time in Kurdistan, Iraq and overall recorded 27 species in Kurdistan, Iraq for the first time. These were *Alcea tholożani*, *Brassica tournefortii*, *Centuria irritans*, *Centuria irritans*, *Celystegia sepium*, *Cousinia rhabhiostegia*, *Cousinia Khorramabadensis var. purpurea*, *Euphorbia boissieriana*, *Onosma asperrimum*, *Phagnalon rupestre*, *Campanula gilliatii*, *Serratula latifolia*, *Dichanthium annulatum*, *Selesia* sp, *Sparganium americanum*, *Marrubium vulgare*, *Umbilicus intermedium*, *Umbilicus intermedium*, *Centaurea macrocephala*, *Centaurea urvillei*, *Prangos* sp, *Leontice minor*, *Cousinia mobayeni*, *Convolvulus betonicifolium*, *Echinops cyanocephalus*, *Marrubium vulgare*, *Cardamine breweri* and recorded three rare species: *Typha lugdunensis*, *Equisetum arvense* and *Rubus caesius*, and two very rare species: *Quercus macranthera* and *Linum velutinum*.

The ecological condition of most sites was 50% to 75% disturbed. Sites with better ecological condition (only 25% disturbed) included the following: Peramagroon (S6), Hawraman (Awesar S4B), Penjween (S5), Sharbazher Area (D12B), Haji Omran (E1) and Garagu (D5).

Plantlife International, an organization involved in international plant conservation measures, has developed criteria for the designation of Important Plant Areas (IPAs) throughout the globe. According to the Plantlife International's website, the criteria for the IPA project have been developed over a period of ten years by a process of consultation involving specialists from many countries (Plantlife, 2008).

Plantlife states that the identification of IPAs is based on three broad criteria listed below. A site qualifies as an IPA if it fulfills one or more of these criteria.

1. Threatened species (sites that hold significant populations of species of global or regional concern),
2. Botanical richness (sites with exceptionally rich flora in a regional context in relation to its biogeographic zone), and
3. Threatened habitats (sites that are outstanding examples of a habitat type of global or regional importance).

A complete list of threatened, rare and/or endemic plants is not yet available for Iraq but an initial assessment was done in Kurdistan, Northern Iraq indicated that five (5) plant species should be included on this list (as mentioned above). The following table lists these plants and the sites where they were found.

Table 3: Rare species observed in the 2008 survey effort

Plant	status	Location	Reference
<i>Rubus caesius</i> (European dewberry)	Rare	Sharbazher Area (D12B) Garagu (D5)	Flora of Iraq, Vol.2, p120
<i>Equisetum arvense</i>	Rare	Sharbazher Area (D12B)	Flora of Iraq, Vol. 2, p55
<i>Typha lugdunensis</i>	Rare	Fishkhaboor-Turkish Border (D11B)	Flora of Iraq, Vol.8, p213
<i>Quercus macranthera</i>	Very rare	Sulav (D2A)	Flora of Iraq, Vol.4, Part1, p49
<i>Linum velutinum</i>	Very rare	Garagu (D5)	Flora of Iraq, Vol.4, Part 1, p281

Evaluation of sites based on their richness and habitat types is still an on-going process within the Nature Iraq KBA Project. The following discussion presents only preliminary findings from the previous surveys.

Plant communities existing in Kurdistan consist of the following:

- Dry steppe zones such as in Kalar (S3) and Fishkhaboor-Syrian Border (D11A);
- Moist steppe zone such as Dukan (S2), Atrush (D3), and Sangaw (S14);
- Forest zones of primarily *Quercus* forests in three main categories: *Quercus aegilops*, *Q. aegilops-Q. infectoria* and *Q. infectoria-Q. libani* (Guest, 1966, p73), which exist in Qara Dagh (S11), Benavi (D6), Sararu (D13), Mangeesh (D8), and Garagu (D5);
- And also Pine forest that is restricted to the Amadiya district of Dohuk in Zawita (D7) with *Pinus halepensis* var. *brutia* as the dominant species and in many places associated with *Quercus aegilops* and *Q. infectoria*. In Awesar (S4B) there also exists a planted *Juglans* forest in association with some wild plants such as *Quercus sp.*, *Prunus microcapa* and *Pistacia eurycarpa*.

The differences in the environmental characteristics such as temperature, soil type, altitude and exposure have the biggest effect on plant diversity and richness. For some site this diversity and richness is high such as in Haji Omran, Sharbazher, Qara Dagh, Peramagoon, Penjween, Garagu and Atrush. For others plant diversity and richness are poor such as in Fishkhaboor on the Syrian border, at Mosul Lake, and Khazar.

There are same factors that affect diversity and richness and cause them to decline:

- 1- Over-grazing is the most important and significant factor in some sites such as Mosul Lake (D10), Gerbeesh (D1B), Kalar (D3) and Dukan Lake (S2). To some degree over-grazing affects the majority of sites in the survey.
- 2- Pesticide use for weeding control and agriculture in Taq Taq (E2) and the Zalm Area (S12).
- 3- Tree/Plant cutting randomly in Ahmed Awa (S4A) and Taq Taq (E2).
- 4- Expansion of roads randomly such as those seen in Ser Amadia (D2A) and Ashab valley (D5B) (see photo below) are also destructive in themselves but in addition open up areas for access that can lead to excessive tree-cutting and other damage.



Plate 55: Road construction impacts in Ashab Valley (D5B)

Sites Important to Fish

Those sites that were surveyed for fish in Kurdistan, Northern Iraq include large lakes and fast-moving rivers and streams. Commercial fishing is taking place at the three large lake sites (Darbandikhan, Dukan and Mosul Lakes) and these are key sites for economically important fish (*Barbus esocinus*, *B.xanthopterus*, *B.grypus*, *Capoeta damascina*, *Cyprinus carpio* and *Carassius auratus*).

Other sites where some commercial fishing is taking place are:

1. Altun Kopri Marsh (E3) has a unique habitat similar to that of the southern marshes and has a rich fish assemblage including (*Barbus esocinus*, *B.xanthopterus*, *Capoeta damascina*, *Cyprinus carpio* and *Carassius carassius*) also fish weight was good attracting many fishermen to the area.

2. Fishkhaboor Area-Syrian Border (D11A) has a diverse fish assemblage and fish reach good weights attracting fishermen to the area (five fishermen were noted at on the lake in summer).
3. Kherazook (E9) had Biz, *Barbus esocinus*, and Shaboot, *B.grypus* that reached adequate weights for economic fisheries.

Other important sites for fish diversity include:

1. Penjween (S5) where *Sabanejewia aurata* was found for the first time in Iraq in 2008 (this fish is common near the Caspian Sea in Iran). Penjween is on the upper reaches of the Little Zap watershed and is located in a border area that may serve as ecological passageway for fish and many other fauna.
2. *Mystus pelusius* was found at Bahraka (E11), which is a fish that appears, from KBA findings in the Mesopotamian marshes, to be threatened in the south.
3. Biz (*Barbus esocinus*), a threatened fish in Iraq, was found at Atrush (D3B).
4. Dohuk Lake (D9), a protected reservoir providing drinking water to the city of Dohuk appears to have a sizeable population (approximately 35%) of an economically important fish Hemry (*Barbus luteus*), was discovered only in this site and at Kalar.

Recent findings of heavy metal contamination in sediments (See KBA-K Water Quality 2008 report and subsequent 2008 Nature Iraq reports on Darbandikhan) and in water and fish tissues taken from Darbandikhan, indicate that there are serious environmental issues facing many watersheds and fisheries in Kurdistan. Overall, uncontrolled pollution inputs into the waters of Kurdistan, Northern Iraq waters are of grave concern. It is likely that these inputs are occurring throughout the watersheds of Iraq and they represent a major threat to environmental and human health within Kurdistan, Northern Iraq and Iraq overall. Further study is needed to document and identify contaminations sources and resources and aggressive action should be dedicated to addressing these problems.

Areas of Concern for Other Species

Nature Iraq was given a film by the Forestry Police of Darbandikhan in November of 2008 showing a Leopard (*Panthera pardus*) that has been killed in October by a land mine near the village of Mortka on the east side of Darbandikhan Lake near the border with Iran. Landmines cover most of the border region between Iraq and Iran, and Iraq & Turkey and these will take many years to clear (in fact it is reported that new land mine fields have been layed on the

Iraq/Turkish border in 2008). These land mines represent a grave hazard to both humans and many larger threatened and near threatened species such as leopards. Current bombardment of border villages by both Iran and Turkey that have been occurring throughout much of 2008, have also created a hazardous situation for both humans and wildlife.



Plate 56: Leopard killed by a land mine near the village of Mortka (Darbandikhan) in October 2008,
From video by the Darbandikhan Forestry Police

Threats to sites in Kurdistan, Northern Iraq

In addition the the threat of landmines discussed above, there are few protected areas within Kurdistan, Northern Iraq. Most sites are, to some degree, utilized for agriculture, grazing, hunting, fishing, industrial development, roads and transportation services, resort development, and urbanization. The Barzan area represents an area that has been under a long-term tribal protection from hunting and many important species can be found there. Other areas have certain restrictions such as fishing moratoriums, limitations on hunting, fencing of small areas to protect from over-grazing, but enforcement is often difficult to non-existent. There are some minor anti-littering campaigns mostly done by non-governmental organizations or municipalities but public compliance is very low and most sites that attract the public for recreation purposes are full of garbage and are not always provided with appropriate resources for maintenance and clean-up. An overall education campaign coupled with regulations and enforcement is needed to change public attitudes and behavior in this regard.

The Kurdistan Environmental and Forestry Police Force(s) have the potential to provide greater protection to sites and control abuses but they require more training and dedicated resources.

Many of Kurdistan's most lovely sights have attracted unsightly development so that in the cases of places such as Bekhal Falls (surveyed in 2007), the development of shops, restaurants and the diversion of water in, around and sometimes over the falls, have overwhelmed the site. Pollution from sewage also plagues many of these sites. Often, as a result, the other species (birds, fish, animals, reptiles, plants, etc) that have historically utilized these sites have been crowded out or adversely impacted. All of these areas require proper management plans with stakeholder involvement to either restore the sites or atleast manage the development of the sites sustainably. The following four plates show some typical impacts seen at many of the sites.



Plate 57: Uncontrolled gravel mining in the river bed at Bahraka (E11)



Plate 58: Electrofishing in Altun Kopri (E3)

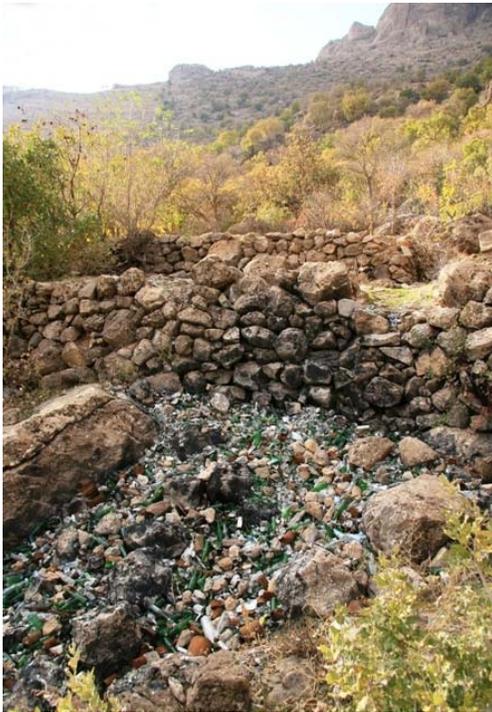


Plate 59: Trash Dump on Peramagron Mountain (S6) Plate 60: Hardening of stream edges and resort development at Gali Ali Beg (S10, Surveyed in 2007)

Designation of Protected Areas within Kurdistan, Northern Iraq

Several areas in Kurdistan have been proposed as official protected areas or parks. Barzan in Erbil Governorate, as mentioned above has enjoyed some tribal protected status for many years and this has preserved the site for current and future generations. Qara Dagħ is a site that is being considered as a park in the Sulaimani Governorate. It should be noted that there is a difference between a recreational park and a protected area. If the area is developed strictly for recreation without regard to efforts to conserve the integrity of the site, the health of the site and/or the species that utilize the site, then ultimately the potential for the area to become degraded is high. Protected areas, such as national or regional parks or wilderness areas, often offer a range of protective restrictions to the use of the site to ensure that it is not degraded and is maintained for future generation.

Should efforts to develop parks and/or protected areas precede further, proper management plans will need to be written with stakeholder involvement. Such plans, once implemented, become living documents that are regularly updated and guide the management of all sectors that utilize or affect the area. Adequate resources (financial and material) must be allocated for the

development and protection of the sites. It is hoped that this document can provide some background information on sites and issues of concern in the development of these areas.

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Annex A: Iraq Bird Species List with Provisional Conservation Status

(Richard Porter, 9 March 2008)

Globally threatened: as classified by BirdLife International and endorsed by IUCN Endemic/Near-endemic: all/most of the world population breeds in Iraq

Conservation Concern: PROVISIONAL ASSESSMENT. This category includes all globally threatened species; endemics/near-endemics; those known to be seriously declining in all/most of their range; those with a major proportion (over 50%) of their world population breeding in the Middle East; those with internationally important wintering populations in Iraq.

Common Name	Scientific Name	Globally threatened	Endemic/ Near-endemic	Conservation Concern
Black Francolin	<i>Francolinus francolinus</i>			
Common Quail	<i>Coturnix coturnix</i>			
Chukar Partridge	<i>Alectoris chukar</i>			
See-see Partridge	<i>Ammoperdix griseogularis</i>			
Greylag Goose	<i>Anser anser</i>			
Greater White-fronted Goose	<i>Anser albifrons</i>			
Lesser White-fronted Goose	<i>Anser erythropus</i>	X		X
Red-breasted Goose	<i>Branta ruficollis</i>	X		X
Mute Swan	<i>Cygnus olor</i>			
Bewick's Swan	<i>Cygnus columbianus bewickii</i>			
Common Shelduck	<i>Tadorna tadorna</i>			
Ruddy Shelduck	<i>Tadorna ferruginea</i>			
Gadwall	<i>Anas strepera</i>			
Eurasian Wigeon	<i>Anas penelope</i>			
Mallard	<i>Anas platyrhynchos</i>			
Northern Shoveler	<i>Anas clypeata</i>			
Northern Pintail	<i>Anas acuta</i>			
Garganey	<i>Anas querquedula</i>			
Eurasian Teal	<i>Anas crecca</i>			
Marbled Duck	<i>Marmaronetta angustirostris</i>	X		X
Red-crested Pochard	<i>Netta rufina</i>			X
Common Pochard	<i>Aythya ferina</i>			
Ferruginous Duck	<i>Aythya nyroca</i>	X		X
Tufted Duck	<i>Aythya fuligula</i>			
Greater Scaup	<i>Aythya marila</i>			
Goldeneye	<i>Bucephala clangula</i>			
Smew	<i>Mergellus albellus</i>			
Red-breasted Merganser	<i>Mergus serratus</i>			
Goosander	<i>Mergus merganser</i>			
White-headed Duck	<i>Oxyura leucocephala</i>	X		X
Little Grebe	<i>Tachybaptus ruficollis</i>			X (endemic race)
Great Crested Grebe	<i>Podiceps cristatus</i>			
Black-necked Grebe	<i>Podiceps nigricollis</i>			
Greater Flamingo	<i>Phoenicopterus [ruber] roseus</i>			X
Western White Stork	<i>Ciconia ciconia</i>			
Black Stork	<i>Ciconia nigra</i>			X
Sacred Ibis	<i>Threskiornis aethiopicus</i>			X
Glossy Ibis	<i>Plegadis falcinellus</i>			
Eurasian Spoonbill	<i>Platalea leucorodia</i>			X
Eurasian Bittern	<i>Botaurus stellaris</i>			X
Little Bittern	<i>Ixobrychus minutus</i>			
Black-crowned Night Heron	<i>Nycticorax nycticorax</i>			
Squacco Heron	<i>Ardeola ralloides</i>			
Cattle Egret	<i>Bubulcus ibis</i>			
Grey Heron	<i>Ardea cinerea</i>			
Goliath Heron	<i>Ardea goliath</i>			X
Purple Heron	<i>Ardea purpurea</i>			
Great White Egret	<i>Ardea [Egretta] alba</i>			
Little Egret	<i>Egretta garzetta</i>			

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Western Reef Heron	<i>Egretta gularis</i>			
Great White Pelican	<i>Pelecanus onocrotalus</i>			X
Dalmatian Pelican	<i>Pelecanus crispus</i>	X		X
Pygmy Cormorant	<i>Phalacrocorax pygmaeus</i>			X
Great Cormorant	<i>Phalacrocorax carbo</i>			
Darter	<i>Anhinga [rufa] melanogaster</i>			X
Lesser Kestrel	<i>Falco naumanni</i>	X		X
Common Kestrel	<i>Falco tinnunculus</i>			
Red-footed Falcon	<i>Falco vespertinus</i>			X
Merlin	<i>Falco columbarius</i>			
Eurasian Hobby	<i>Falco subbuteo</i>			
Lanner	<i>Falco biarmicus</i>			X
Saker	<i>Falco cherrug</i>	X		X
Peregrine Falcon	<i>Falco peregrinus</i>			
Barbary Falcon	<i>Falco pelegrinoides</i>			
Osprey	<i>Pandion haliaetus</i>			
European Honey-buzzard	<i>Pernis apivorus</i>			
Black-winged Kite	<i>Elanus caeruleus</i>			
Red Kite	<i>Milvus milvus</i>			
Black Kite	<i>Milvus migrans</i>			
Pallas's Fish Eagle	<i>Haliaeetus leucoryphus</i>	X		X
White-tailed Eagle	<i>Haliaeetus albicilla</i>			
Lammergeier	<i>Gypaetus barbatus</i>			X
Egyptian Vulture	<i>Neophron percnopterus</i>	X		X
Eurasian Griffon Vulture	<i>Gyps fulvus</i>			
Cinereous Vulture	<i>Aegypius monachus</i>			X
Short-toed Snake Eagle	<i>Circus gallicus</i>			
Western Marsh Harrier	<i>Circus aeruginosus</i>			
Hen Harrier	<i>Circus Cyaneus</i>			
Pallid Harrier	<i>Circus macrourus</i>			X
Montagu's Harrier	<i>Circus pygargus</i>			
Eurasian Sparrowhawk	<i>Accipiter nisus</i>			
Levant Sparrowhawk	<i>Accipiter brevipes</i>			X
Steppe Buzzard	<i>Buteo b. vulpinus</i>			
Long-legged Buzzard	<i>Buteo rufinus</i>			
Lesser Spotted Eagle	<i>Aquila pomarina</i>			
Greater Spotted Eagle	<i>Aquila clanga</i>	X		X
Steppe Eagle	<i>Aquila nipalensis</i>			X
Asian Imperial Eagle	<i>Aquila heliaca</i>	X		X
Golden Eagle	<i>Aquila chrysaetos</i>			X
Booted Eagle	<i>Aquila [Hieraetus] pennata[pennatus]</i>			
Bonelli's Eagle	<i>Aquila [Hieraetus] fasciata [fasciatus]</i>			
Macqueen's Bustard	<i>Chlamydotis macqueenii</i>	X		X
Water Rail	<i>Rallus aquaticus</i>			
Corncrake	<i>Crex crex</i>	X		X
Little Crane	<i>Porzana parva</i>			
Spotted Crane	<i>Porzana porzana</i>			
Purple Swampphen	<i>Prophyrio prophyrio</i>			X
Common Moorhen	<i>Gallinula chloropus</i>			
Eurasian Coot	<i>Fulica atra</i>			
Common Crane	<i>Grus grus</i>			X
Eurasian Stone-curlew	<i>Burbinus oedicnemus</i>			
Crab-Plover	<i>Dromas ardeola</i>			X
Eurasian Oystercatcher	<i>Haematopus</i>			
Black-winged Stilt	<i>Himantopus ostralegus</i>			
Pied Avocet	<i>Recurvirostra avosetta</i>			
Northern Lapwing	<i>Vanellus vanellus</i>			
Spur-winged Lapwing	<i>Vanellus (Hoplopterus) spinosus</i>			X
Red-wattled lapwing	<i>Vanellus (Hoplopterus) indicus</i>			
Sociable Lapwing	<i>Vanellus gregarius (Chettusia gregaria)</i>	X		X
White-tailed Lapwing	<i>Vanellus leucurus (Chettusia leucura)</i>			X
Common Ringed Plover	<i>Charadrius hiaticula</i>			

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Little Ringed Plover	<i>Charadrius dubius</i>			
Kentish Plover	<i>Charadrius alexandrinus</i>			
Lesser Sand Plover	<i>Charadrius mongolus</i>			
Greater Sand Plover	<i>Charadrius leschenaultii</i>			
Caspian Plover	<i>Charadrius asiaticus</i>			
Eurasian Dotterel	<i>Charadrius morinellus</i>			
Eurasian Woodcock	<i>Scolopax rusticola</i>			
Jack Snipe	<i>Lymnocyptes minimus</i>			
Great Snipe	<i>Callinago media</i>			X
Common Snipe	<i>Callinago callinago</i>			
Black-tailed Godwit	<i>Limosa limosa</i>	X		X
Bar-tailed Godwit	<i>Limosa lapponica</i>			
Whimbrel	<i>Numenius phaeopus</i>			
Slender-billed Curlew	<i>Numenius tenuirostris</i>	X		X
Eurasian Curlew	<i>Numenius arquata</i>			
Spotted Redshank	<i>Tringa erythropus</i>			
Common Redshank	<i>Tringa totanus</i>			
Marsh Sandpiper	<i>Tringa stagnatilis</i>			
Common Greenshank	<i>Tringa nebularia</i>			
Green Sandpiper	<i>Tringa ochropus</i>			
Wood Sandpiper	<i>Tringa</i>			
Terek Sandpiper	<i>Xenus cinerea</i>			
Common Sandpiper	<i>Actitis hypoleucos</i>			
Ruddy Turnstone	<i>Arenaria interpres</i>			
Sanderling	<i>Calidris alba</i>			
Little Stint	<i>Calidris minuta</i>			
Temminck's Stint	<i>Calidris temminckii</i>			
Curlew Sandpiper	<i>Calidris ferruginea</i>			
Dunlin	<i>Calidris alpina</i>			
Broad-billed Sandpiper	<i>Calidris falcinellus</i>			X
Ruff	<i>Philomachus pugnax</i>			
Red-necked Phalarope	<i>Phalaropus lobatus</i>			
Cream-coloured Courser	<i>Cursorius cursor</i>			
Collared Pratincole	<i>Glareola pratincola</i>			X
Black-winged Pratincole	<i>Glareola nordmanni</i>	X		X
Common Gull	<i>Larus canus</i>			
Yellow-legged Gull	<i>Larus michahellis</i>			
Armenian Gull	<i>Larus armenicus</i>			X
Baltic (Lesser Black-backed) Gull	<i>Larus fuscus</i>			
Great Black-headed Gull	<i>Larus ichthyaetus</i>			
Common Black-headed Gull	<i>Larus ridibundus</i>			
Slender-billed Gull	<i>Larus genei</i>			X
Little Gull	<i>Larus minutus</i>			
Gull-billed Tern	<i>Gelochelidon [Sterna] nilotica</i>			
Caspian Tern	<i>Hydroprogne [Sterna] caspia</i>			X
Sandwich Tern	<i>Sterna sandvicensis</i>			
Common Tern	<i>Sterna hirundo</i>			
White-cheeked Tern	<i>Sterna repressa</i>			
Little Tern	<i>Sternula [Sterna] albifrons</i>			
Birdled Tern	<i>Onychoprion [Sterna] anaethetus</i>			
Whiskered Tern	<i>Chlidonias hybrida</i>			
White-winged Tern	<i>Chlidonias leucopterus</i>			
Black Tern				
Pin-tailed Sandgrouse	<i>Pterocles albata</i>			X
Black-bellied Sandgrouse	<i>Pterocles orientalis</i>			
Spotted Sandgrouse	<i>Pterocles senegallus</i>			X
Rock Dove	<i>Columba livia</i>			
Stock Dove	<i>Columba oenas</i>			
Common Woodpigeon	<i>Columba palumbus</i>			
European Turtle Dove	<i>Streptopelia turtur</i>			X
Oriental Turtle Dove	<i>Streptopelia orientalis</i>			
Eurasian Collared Dove	<i>Streptopelia decaocto</i>			

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Laughing Dove	<i>Streptopelia senegalensis</i>			
Namaqua Dove	<i>Oena capensis</i>			
Rose-ringed Parakeet	<i>Psittacula krameri</i>			
Great Spotted Cuckoo	<i>Clamator glandarius</i>			
Common Cuckoo	<i>Cuculus canorus</i>			
Barn Owl	<i>Tyto alba</i>			
Pallid Scops Owl	<i>Otus brucei</i>			
Eurasian Scops Owl	<i>Otus scops</i>			
Eurasian Eagle Owl	<i>Bubo bubo</i>			
Tawny Owl	<i>Strix aluco</i>			
Little Owl	<i>Athene noctua</i>			
Long-eared Owl	<i>Asio otus</i>			
Short-eared Owl	<i>Asio flammeus</i>			
Egyptian Nightjar	<i>Caprimulgus aegyptius</i>			
European Nightjar	<i>Caprimulgus europaeus</i>			
Alpine Swift	<i>Tachymarptis [Apus] melba</i>			
Common Swift	<i>Apus apus</i>			
Pallid Swift	<i>Apus pallidus</i>			
Little Swift	<i>Apus affinis</i>			
Indian Roller	<i>Coracias benghalensis</i>			
European Roller	<i>Coracias garrulus</i>			X
White-throated Kingfisher	<i>Halcyon smyrnensis</i>			
Common Kingfisher	<i>Alcedo atthis</i>			
Pied Kingfisher	<i>Ceryle rudis</i>			
Little Green Bee-eater	<i>Merops orientalis</i>			
Blue-cheeked Bee-eater	<i>Merops [superciliosus] persicus</i>			
European Bee-eater	<i>Merops apiaster</i>			
Eurasian Hoopoe	<i>Upupa epops</i>			
Eurasian Wryneck	<i>Jynx torquilla</i>			
Lesser Spotted Woodpecker	<i>Dendrocopos minor</i>			
Middle Spotted Woodpecker	<i>Dendrocopos medius</i>			
Syrian Woodpecker	<i>Dendrocopos syriacus</i>			
European Green Woodpecker	<i>Picus viridis</i>			
PASSERIFORMES				
Red-backed Shrike	<i>Lanius Collurio</i>			
Daurian Isabelline Shrike	<i>Lanius isabellinus isabellinus</i>			
Lesser Grey Shrike	<i>Lanius minor</i>			
Great Grey Shrike	<i>Lanius excubitor</i>			
Southern Grey Shrike	<i>Lanius meridionalis</i>			
Woodchat Shrike	<i>Lanius senator</i>			
Masked Shrike	<i>Lanius nubicus</i>			X
Eurasian Golden Oriole	<i>Oriolus oriolus</i>			
Eurasian Magpie	<i>Pica pica</i>			
Eurasian Jay	<i>Garrulus glandarius</i>			
Red-billed Chough	<i>Pyrrhocorax pyrrhocorax</i>			
Yellow-billed Chough	<i>Pyrrhocorax graculus</i>			
Western Jackdaw	<i>Corvus monedula</i>			
Rook	<i>Corvus frugilegus</i>			
Hooded Crow	<i>Corvus[corone] cornix</i>			X (endemic race)
Brown-necked Raven	<i>Corvus ruficollis</i>			
Northern Raven	<i>Corvus corax</i>			
Grey Hypocolius	<i>Hypocolius ampelinus</i>		X	X
Sombre Tit	<i>Poecile lugubris</i>			X
Great Tit	<i>Parus major</i>			
Blue Tit	<i>Cyanistes caeruleus</i>			
Eurasian Penduline Tit	<i>Remiz pendulinus</i>			
Sand Martin	<i>Riparia riparia</i>			
Barn Swallow	<i>Hirundo rustica</i>			
Red-rumped Swallow	<i>Cecropis daurica</i>			
Eurasian Crag Martin	<i>Ptyonoprogne [Hirundo] rupestris</i>			
Common House Martin	<i>Delichon urbicum [urbica]</i>			
Long-tailed Tit	<i>Aegithalos caudatus</i>			

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Greater Hoopoe-Lark	<i>Alaemon alaudipes</i>			
Calandra Lark	<i>Melanocorypha calandra</i>			
Bimaculated Lark	<i>Melanocorypha bimaculata</i>			
Bar-tailed Lark	<i>Ammomanes cinctura</i>			
Desert Lark	<i>Ammomanes deserti</i>			
Greater Short-toed Lark	<i>Calandrella brachydactyla</i>			
Lesser Short-toed Lark	<i>Calandrella rufescens</i>			
Crested Lark	<i>Galerida cristata</i>			
Woodlark	<i>Lullula arborea</i>			
Eurasian Skylark	<i>Alauda arvensis</i>			
Black-crowned Sparrow-lark	<i>Eremophrix nigricaps</i>			
Horned Lark	<i>Eremophila alpestris</i>			
Temminck's Lark	<i>Eremophila bilopha</i>			X
Zitting Cisticola	<i>Cisticola juncidis</i>			
Graceful Prinia	<i>Prinia gracilis</i>			
White-cheeked Bulbul	<i>Pycnonotus leucogenys</i>			X
Cetti's Warbler	<i>Cettia cetti</i>			
Common Grasshopper Warbler	<i>Locustella lanceolata</i>			
River Warbler	<i>Locustella fluviatilis</i>			
Savi's Warbler	<i>Locustella luscinoides</i>			
Basra Reed Warbler	<i>Acrocephalus griseldis</i>	X	X	X
Great Reed Warbler	<i>Acrocephalus arundinaceus</i>			
Clamorous Reed Warbler	<i>Acrocephalus stentoreus</i>			
Moustached Warbler	<i>Acrocephalus menanopogon</i>			
Sedge Warbler	<i>Acrocephalus schoenobaenus</i>			
Eurasian Reed Warbler	<i>Acrocephalus scirpaceus</i>			
Marsh Warbler	<i>Acrocephalus palustris</i>			
Eastern Olivaceous Warbler	<i>Iduna [Hippolais] pallida</i>			
Upcher's Warbler	<i>Hippolais languida</i>			
Icterine Warbler	<i>Hippolais icterina</i>			
Willow Warbler	<i>Phylloscopus trochilus</i>			
Common Chiffchaff	<i>Phylloscopus collybita</i>			
Mountain Chiffchaff	<i>Phylloscopus [lorenzii] sindianus</i>			
Eastern Bonelli's Warbler	<i>Phylloscopus [bonelli] orientalis</i>			
Wood Warbler	<i>Phylloscopus sibilatrix</i>			
Yellow-browed Warbler	<i>Phylloscopus inornatus</i>			
Eurasian Blackcap	<i>Sylvia atricapilla</i>			
Garden Warbler	<i>Sylvia borin</i>			
Barred Warbler	<i>Sylvia nisoria</i>			
Lesser Whitethroat	<i>Sylvia curruca</i>			
Eastern Orphean Warbler	<i>Sylvia crassirostris</i>			
Asian Desert Warbler	<i>Sylvia nana</i>			
Common Whitethroat	<i>Sylvia communis</i>			
Spectacled Warbler	<i>Sylvia conspicillata</i>			
Ménétries's Warbler	<i>Sylvia mystacea</i>			
Iraq Babbler	<i>Turdoides altirostris</i>		X	X
Common Babbler	<i>Turdoides caudata</i>			
Bearded Tit	<i>Panurus biarmicus</i>			
Winter Wren	<i>Troglodytes troglodytes</i>			
Eurasian Nuthatch	<i>Sitta europaea</i>			
Eastern Rock Nuthatch	<i>Sitta tephronota</i>			X
Western Rock Nuthatch	<i>Sitta neumayer</i>			X
Wallcreeper	<i>Tichodroma muraria</i>			
Common Myna	<i>Acridotheres tristis</i>			
Rose-coloured Starling	<i>Sturnus roseus</i>			
Common Starling	<i>Sturnus vulgaris</i>			
Ring Ouzel	<i>Turdus torquatus</i>			
Eurasian Blackbird	<i>Turdus merula</i>			
Black-throated Thrush	<i>Turdus atrogularis</i>			
Fieldfare	<i>Turdus pilaris</i>			
Redwing	<i>Turdus iliacus</i>			
Song Thrush	<i>Turdus philomelos</i>			

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Mistle Thrush	<i>Turdus viscivorus</i>			
European Robin	<i>Erithacus rubecula</i>			
Bluethroat	<i>Luscinia svecica</i>			
Thrush Nightingale	<i>Luscinia luscinia</i>			
Common Nightingale	<i>Luscinia megarhynchos</i>			
White-throated Robin	<i>Irania gutturalis</i>			X
Rufous-tailed Scrub Robin	<i>Cercotrichas [Erythropygia] galactotes</i>			
Eversmann's Redstart	<i>Phoenicurus erythronotus</i>			
Black Redstart	<i>Phoenicurus ocburos</i>			
Common Redstart	<i>Phoenicurus phoenicurus</i>			
Whinchat	<i>Saxicola rubetra</i>			
Eurasian Stonechat	<i>Saxicola torquatus (S. rubicola)</i>			
Pied Stonechat	<i>Saxicola caprata</i>			
Red-rumped Wheatear	<i>Oenanthe moesta</i>			
Isabelline Wheatear	<i>Oenanthe isabellina</i>			
Northern Wheatear	<i>Oenanthe oenanthe</i>			
Rufous-tailed Wheatear	<i>Oenanthe xanthopygma</i>			X
Pied Wheatear	<i>Oenanthe pleschanka</i>			
Black-eared Wheatear	<i>Oenanthe hispanica</i>			
Desert Wheatear	<i>Oenanthe deserti</i>			
Mourning Wheatear	<i>Oenanthe lugens</i>			
Finsch's Wheatear	<i>Oenanthe finschii</i>			X
Hume's Wheatear	<i>Oenanthe albonigra</i>			X
Rufous-tailed Rock Thrush	<i>Monticola saxatilis</i>			
Blue Rock Thrush	<i>Monticola solitarius</i>			
Spotted Flycatcher	<i>Muscicapa striata</i>			
Eurasian Pied Flycatcher	<i>Ficedula hypoleuca</i>			
Collared Flycatcher	<i>Ficedula albicollis</i>			
Semi-collared Flycatcher	<i>Ficedula semitorquata</i>			
Red-breasted Flycatcher	<i>Ficedula parva</i>			
White-throated Dipper	<i>Cinclus cinclus</i>			
House Sparrow	<i>Passer domesticus</i>			
Spanish Sparrow	<i>Passer hispaniolensis</i>			
Dead Sea Sparrow	<i>Passer moabiticus</i>			X
Eurasian Tree Sparrow	<i>Passer montanus</i>			
Pale Rockfinch	<i>Carpospiza brachydactyla</i>			
Rock Sparrow	<i>Petronia petronia</i>			
Yellow-throated Sparrow	<i>Gymnoris [Petronia] xanthocollis</i>			X
White-winged Snowfinch	<i>Montifringilla nivalis</i>			
Alpine Accentor	<i>Prunella collaris</i>			
Radde's Accentor	<i>Prunella ocularis</i>			X
Duncock	<i>Prunella modularis</i>			
Western Yellow Wagtail	<i>Motacilla flava</i>			
Black-headed Wagtail	<i>Motacilla flava feldegg</i>			
Grey Wagtail	<i>Motacilla cinerea</i>			
White Wagtail	<i>Motacilla alba</i>			
Citrine Wagtail	<i>Motacilla citreola</i>			
Richard's Pipit	<i>Anthus richardi</i>			
Tawny Pipit	<i>Anthus campestris</i>			
Long-billed Pipit	<i>Anthus similis</i>			
Meadow Pipit	<i>Anthus pratensis</i>			
Tree pipit	<i>Anthus trivialis</i>			
Red-throated Pipit	<i>Anthus cervinus</i>			
Water Pipit	<i>Anthus spinoletta</i>			
Common Chaffinch	<i>Fringilla coelebs</i>			
Brambling	<i>Fringilla montifringilla</i>			
Red-fronted Serin	<i>Serinus pusillus</i>			
European Serin	<i>Serinus serinus</i>			
European Greenfinch	<i>Carduelis chloris</i>			
Eurasian Siskin	<i>Carduelis spinus</i>			
European Goldfinch	<i>Carduelis carduelis</i>			
Twite	<i>Carduelis flavirostris</i>			

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Linnet	<i>Carduelis cannabina</i>			
Crimson-winged Finch	<i>Rhodopechys sanguineus</i>			
Trumpeter Finch	<i>Bucanetes githagineus</i>			
Desert Finch	<i>Rhodospiza obsoletus</i>			
Hawfinch	<i>Coccothraustes coccothraustes</i>			
Corn Bunting	<i>Emberiza [Miliaria] calandra</i>			
Yellowhammer	<i>Emberiza citrinella</i>			
Pine Bunting	<i>Emberiza leucocephalos</i>			
Rock Bunting	<i>Emberiza cia</i>			
Cinereous Bunting	<i>Emberiza cineracea</i>	X		X
Ortolan Bunting	<i>Emberiza hortulana</i>			
Black-headed Bunting	<i>Emberiza melanocephala</i>			
Common Reed Bunting	<i>Emberiza schoeniclus</i>			

Annex B: Plates of Some Key Bird Species of Kurdistan, Northern Iraq

Note: All photos by Korsh Ararat



Pycnonotus leucogenys at Darbandikhan (S1) in winter 2008



Oenanthe finschii at Darbandikhan (S1) in winter 2008



Tadorna ferruginea & *Anser erythropus* at Mosul Lake (D10) in winter 2008



Larus armenicus at Mosul Lake (D10) in winter 2008



Aquila beliaca at S9 in winter 2008



Aquila chrysaetos at Mosul Lake (D10) in winter 2008



Emberiza cineracea at (D1) in Summer 2008



Passer moabiticus at D11 in Summer 2008



Sitta tephronota at (S7) in Summer 2008



Coracias garrulous at (E5) in Summer 2008



Larus genei chick and egg at Mosul Lake (D10) in Summer 2008



Larus genei nesting at Mosul Lake (D10) in Summer 2008



Neophron percnopterus at (E5) in Summer 2008



Falco naumani at (D2B) in Summer 2008

Annex C: Iraq fish species of Economic Importance and Conservation Priority

(from Coad *et al.* In prep. The Freshwater Fishes of Iraq). This text was prepared by C.D.A. Rubec and B. Coad drawing on Coad *et al.* (in preparation). Species that rank both “high” in economic importance and “high” or “possibly high” or are listed as “rare”, “of concern” or on the “IUCN Red List” are suggested as Special Species of Concern (SSCs). Species recorded in the southern KBA work are highlighted “KBA.” Species recorded in the Kurdistan, Northern Iraq KBA work is highlighted as “K-KBA”.

Species	Common Names	Economic Importance	Priority for Conservation Action
Genus <i>Carcharhinus</i>			
1. <i>Carcharhinus leucas</i>	Kosetch; kossage; koseage. [bull shark].	Moderate	None required
Family Engraulidae (anchovies)			
Genus <i>Thryssa</i>			
2. <i>Thryssa hamiltonii</i> KBA	Balam; shega; usbur. [Hamilton's thryssa].	High	Unknown
3. <i>Thryssa mystax</i> KBA	Nd	Unknown	Unknown
4. <i>Thryssa whiteheadi</i>	None. [Whitehead's thryssa].	Low	Unknown
Family Clupeidae (herrings, shads, sardines, pilchards and menhadens)			
Genus <i>Nematalosa</i> (shads)			
5. <i>Nematalosa nasus</i> KBA	Jaffot; yaffoud; juwwaf; shroom. [Bloch's gizzard shad, hairback].	High	Unknown
Genus <i>Tenualosa</i>			
6. <i>Tenualosa ilisha</i> KBA	Sbour; zoboos; soboor; sobour. [hilsa, Indian shad or river shad].	High	High ¹
Family Cyprinidae (carp, minnows)			
Genus <i>Acanthobrama</i>			
7. <i>Acanthobrama marmid</i> KBA, K-KBA	Semnan arrez; semnan areed	Moderate	Unknown
Genus <i>Alburnoides</i> (riffle minnows)			
8. <i>Alburnoides bipunctatus</i>	None [spirlin, riffle minnow or riffle bleak].	Moderate	High, possibly, rare in Europe
Genus <i>Alburnus</i>			
9. <i>Alburnus caeruleus</i> KBA, K-KBA	Lassafa.	None	Unknown
10. <i>Alburnus mossulensis</i> KBA, K-KBA	Semnan; simnan; semnan tuyel; sink; zurri	Moderate	None
Genus <i>Aspius</i> (asps)			
11. <i>Aspius vorax</i> KBA, K-KBA	Shillig; shillik; shelej; shalaj; sholgeh; bu aliawi; abu elawi.	High	Moderate
Genus <i>Barbus</i> (barbels)			
12. <i>Barbus barbulus</i>	Abu-barattum; abu baratem; abu bratum; nabbash.	High	High, possibly.
13. <i>Barbus esocinus</i> KBA, K-KBA	Bizz; farkh; farkh; farkh-el-biz; mangar. [Tigris “salmon”, Euphrates “salmon”, pike barb].	High	High, possibly; under severe threat in the Syrian Euphrates; part of a world survey to assess the status of large freshwater fish species by the World Wildlife Fund and the National Geographic Society
14. <i>Barbus grypus</i> KBA, K-KBA	Shabout; shabbout; hamrawi. [large-scaled barb].	High	High in some regions of Iraq; it is in need of conservation in some parts of its range
15. <i>Barbus kersin</i>	Jassan; shissan; jazzan; gazzan; djissan; barzam; barsam; kersin	Moderate	Unknown
16. <i>Barbus kosswigi</i>	None.	None	Unknown; it appears to be rare
17. <i>Barbus lacerta</i>	Shabout moraaqqat	Low	Unknown-Low; this species is near

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Species	Common Names	Economic Importance	Priority for Conservation Action
			threatened in the south Caspian Sea.
18. <i>Barbus luteus</i> KBA, K-KBA	Himri; hamria or hamra; binni hamour, binni hamri, binni himri, binni shifatha, beni asphar; beni abjad or beni eblas (for <i>Systomus albus</i>); zurri; bartema. [golden barb].	High	Moderate
19. <i>Barbus pectoralis</i>	Nebbash; sheikh san.	Moderate	Low
20. <i>Barbus sharpeyi</i> KBA, K-KBA	Binni, binni, bunia; aradah	High	Moderate-Low
21. <i>Barbus subquincunciatus</i> K-KBA	Abu khazzama; a'djzan; agzan; adzan. [black spot barb, leopard barbel].	Low	Unknown, possibly High; It is now very rare in Iran and "critically endangered". Syrian populations in the Euphrates River and parts of its tributaries are also in a perilous state.
22. <i>Barbus xanthopterus</i> KBA, K-KBA	Gattan; ghattan; kattan; khattan; nobbash; thekar.	High	High; This species is now relatively rare. ²
Genus <i>Barilius</i>			
23. <i>Barilius mesopotamicus</i>	Sboura iraqia.	None	None required
Genus <i>Caecocypris</i>			
24. <i>Caecocypris basimi</i>	None.	None	High, Listed as Vulnerable (D2) in the 2004 IUCN Red List of Threatened Species.
Genus <i>Capoeta</i> (twiny or touyeni)			
25. <i>Capoeta aculeata</i>	None	None	Unknown
26. <i>Capoeta barroisi</i>	None [spotted barb].	None	Unknown
27. <i>Capoeta damascina</i> K-KBA	Toueni; toyueni; twena; bertin; bartin; tin; zardah masih; tela shami.	None	Unknown
28. <i>Capoeta trutta</i>	Touyeni; twena; hemira; tela morqat; kwesa; ethra.	Low	Low
Genus <i>Carassius</i> (goldfish)			
29. <i>Carassius auratus</i> KBA, K-KBA	Samak zahabi; buj-buj; samti; yaybash; karssen [goldfish].	Moderate	None required
Genus <i>Chondrostoma</i> (nases)			
30. <i>Chondrostoma regium</i> K-KBA	Baloot muluki; pangka; zurri	Unknown, likely low	Low
Genus <i>Ctenopharyngodon</i> (grass carp)			
31. <i>Ctenopharyngodon idella</i> KBA	Carp eshaby. [grass carp, white amur].	Moderate	None required
Genus <i>Cyprinion</i>			
32. <i>Cyprinion kais</i> K-KBA	Bunni saghir; bnaini; kais	None	Moderate; This species appears to be rare.
33. <i>Cyprinion macrostomum</i> K-KBA	Himriya sefra; hmariya sefra; surrah masih; dunbuk kabir al-fam; dombok or dumbek [large-mouthed barb].	High	None required
Genus <i>Cyprinus</i> (carp)			
34. <i>Cyprinus carpio</i> KBA, K-KBA	Carp; carp shaech; samti [carp, European carp, German carp, wild carp; mirror carp, leather carp, line carp, naked carp (last four referring to different forms of scalation), koi (aquarium variety)].	High	None required
Genus <i>Garra</i>			
35. <i>Garra rufa</i> K-KBA	Djulake; kokur ahmar; karkoor ahmar; algargor alahmer.	Moderate	None required
36. <i>Garra variabilis</i>	Karkoor mit-la'oon.	None	Unknown

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Species	Common Names	Economic Importance	Priority for Conservation Action
Genus <i>Hemiculter</i> (sawbellies)			
37. <i>Hemiculter leucisculus</i>	None [sharpbelly, common sawbelly, knifefish].	Low	None required
Genus <i>Hemigrammocapoeta</i>			
38. <i>Hemigrammocapoeta elegans</i>	None.	None	Unknown; This species is rarely collected in Iraq
Genus <i>Hypophthalmichthys</i> (silver carp)			
39. <i>Hypophthalmichthys molitrix</i> K-KBA	None. [silver carp, thickforehead, white thickforehead].	High	None required
40. <i>Hypophthalmichthys nobilis</i> K-KBA	None. [bighead, painted thickforehead].	High	None required - Low
Genus <i>Squalius</i> (daces)			
41. <i>Squalius cephalus</i>	Bir-aan siphaloos. [European chub].	Low	Low
42. <i>Squalius lepidus</i>	Bara'an; bir-aan abiadh.	None	Unknown
Genus <i>Typhlogarra</i>			
43. <i>Typhlogarra widdowsoni</i>	Samak aa'ama. [Iraq blind barb].	None	High, Listed as Vulnerable (D2) on the 2004 IUCN Red List of Threatened Species.
Family Cobitidae (loaches)			
Genus <i>Cobitis</i>			
44. <i>Cobitis taenia</i> KBA	Lakh mukhattat. [spined or spiny loach, stone loach, weatherfish, spotted weatherfish, Siberian loach].	Low-Moderate	Unknown, possibly High, This species is classified as rare in Europe. ³
Family Balitoridae (loaches)			
Genus <i>Barbatula</i>			
45. <i>Barbatula argyrogramma</i>	Kebudi	None	Unknown
46. <i>Barbatula frenata</i>	Lakh; telay	None	Unknown
Genus <i>Paracobitis</i>			
47. <i>Paracobitis malapterura</i>	Lakh	None	Unknown
Family Sisoridae (sisorid or sucker catfishes)			
Genus <i>Glyptothorax</i>			
48. <i>Glyptothorax kurdistanicus</i> K-KBA	None	None	Moderate-High, possibly; poorly known in Iraq and may be rare enough to warrant conservation efforts
49. <i>Glyptothorax steindachneri</i>	None	None	High, possibly; This species is poorly known in Iraq and may be rare enough to warrant conservation efforts should it prove to be a valid taxon.
Family Siluridae (sheatfishes)			
Genus <i>Silurus</i> (catfishes)			
50. <i>Silurus triostegus</i> KBA, K-KBA	Jirri; djirri; girri; yerrri. [Mesopotamian catfish].	Moderate-Low	Unknown, possibly Moderate.
Family Heteropneustidae (stinging or airsac catfishes)			
Genus <i>Heteropneustes</i>			
51. <i>Heteropneustes fossilis</i> KBA, K-KBA	Samaka; dood; abu-al hakim; abu-al-hakam; abu-al-hukum; samma; djirri lasseye; jamhoori [Indian stinging catfish].	Low	None required
Family Ariidae			
52. <i>Netuma bilineatus</i>	Nd	Unknown	Unknown
53. <i>Plicofollis layardi</i>	Nd	Unknown	Unknown
Family Bagridae (bagrid catfishes)			
Genus <i>Mystus</i>			
54. <i>Mystus pelusius</i> KBA, K-KBA	Abu-zummair; abouz-zoumeir; abu-al-zamir; abu'l-zoumeir; jahudi; zugzug	None	Low-None required

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Species	Common Names	Economic Importance	Priority for Conservation Action
Family Mugilidae (mulletts or grey mulletts)			
Genus <i>Liza</i>			
55. <i>Liza abu</i> KBA, K-KBA	Khishni; hishni; hosoon or hashoun; maid; abu-khraiza; abu sukkanejn [abu mullet, freshwater mullet].	High	Moderate; a ban on fishing from mid-January to mid-May has been recommended. ⁴
56. <i>Liza klunzingeri</i>	Maid; biah; biah zahbee; beyah zhabee. [Klunzinger's mullet (keeled mullet and back keeled mullet).]	Moderate	Moderate; this species needs to be carefully monitored as it is part of a fishery.
57. <i>Liza oligolepis</i> : Reported from Qurna on the Tigris and the Shatt al Arab River and Hammar Marsh.	Nd	Unknown	Unknown
58. <i>Liza subviridis</i> KBA	Biah; maid; meid; biah akhter; beyah akhter. [greenback mullet, greenback grey mullet, silver mullet].	High	Unknown-Moderate
Family Hemiramphidae			
Genus Hemiramphus and Genus Hyporhamphus: recorded in mid 1800s in Iraq			
Genus Rhynchorhamphus			
59. <i>Rhynchorhamphus georgii</i> : Recorded in the literature from the Shatt al Arab River and Hammar Marsh.	Nd	Unknown	Unknown
Family Belontiidae			
Genus Strongylura			
60. <i>Strongylura strongylurus</i> : Recorded from the Shatt al Arab River and Hammar Marsh.	Nd	Unknown	Unknown
Family Cyprinodontidae (tooth-carps, killifishes or pupfishes)			
Genus <i>Aphanius</i>			
61. <i>Aphanius dispar</i>	Harsun; batrikh; batrikh motakayer. [high-finned pupfish, Arabian killifish, mother of pearl fish].	Low, potentially High	Moderate
62. <i>Aphanius mento</i> KBA	Batrikh qabras. [Persian pupfish, Persian minnow, Black Persian minnow, Persian killie].	Moderate	Unknown
Family Poeciliidae			
Genus <i>Gambusia</i>			
63. <i>Gambusia affinis</i> : It is possible that some populations exist in Iraq; this remains to be determined.	Nd	Unknown	Unknown
64. <i>Gambusia holbrooki</i> K-KBA	Gambuzi; zoory; zurry. [mosquitofish; eastern mosquitofish (for holbrooki); western mosquitofish for affinis); plague minnow in reference to its ecological impact].	Moderate	None required
Genus <i>Poecilia</i>			
65. <i>Poecilia latipinna</i>	None	Moderate	None required
Family Mastacembelidae (spiny eels)			
Genus <i>Mastacembelus</i>			
66. <i>Mastacembelus mastacembelus</i> KBA, K-KBA	salbough abu-el-sian, salbu-al-sayan or saebouh abou siyan; abu salambah; marmaritch or marmarij at Mosul. [Mesopotamian spiny eel].	Low	None required
Family Platycephalidae			
Genus <i>Platycephalus</i>			
67. <i>Platycephalus indicus</i> KBA: Reported from the Shatt al Arab River and the Hammar Marsh.	Nd	Unknown	Unknown

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Species	Common Names	Economic Importance	Priority for Conservation Action
Family Sillaginidae			
Genus Sillago			
68. <i>Sillago sibama</i> KBA: Reported from the Shatt al Arab River and occasionally in the marshes.	Nd	Unknown	Unknown
Family Sparidae			
Genus Acanthopagrus			
69. <i>Acanthopagrus berda</i> KBA: Reported from southern Iraq fresh waters including the Tigris River at Baghdad, the Hammar Marsh and the Shatt al Arab River.	Nd	Unknown	Unknown
70. <i>Acanthopagrus latus</i> KBA	Shanak; shagoom; shaam; sha'm; shaem; sheim; sha-om. [yellow-finned porgy or seabream, yellow-finned black porgy, Japanese silver bream].	High	Moderate; the status of freshwater populations is unclear as they appear quite rare. ⁵
Genus			Sparidentex
71. <i>Sparidentex basta</i> KBA: Recorded from Al Disam at the lower part of the Hawizeh Marsh, 5 km from the border with Iran and from the eastern Hammar Marsh in 2005.	Nd	Unknown	Unknown
Family Sciaenidae			
Genus Johnius			
72. <i>Johnius belangerii</i> KBA: Reported from the Hammar Marsh.	Nd	Unknown	Unknown
Genus Otolithes			
73. <i>Otolithes rubber</i> KBA: Reported from the Shatt al Arab River and the Hammar Marsh.	Nd	Unknown	Unknown
Family Cichlidae			
Genus Oreochromis			
74. <i>Oreochromis niloticus</i> : Introduced to the Tigris River basin in Iraq but did not apparently survive winterkill.	Nd	Unknown	Unknown
Genus Tilapia (tilapia)			
75. <i>Tilapia zilli</i>	Nd	Unknown	Unknown
Genus Bathygobius			
76. <i>Bathygobius fuscus</i> KBA: Recorded from the Hammar Marsh and Shatt al Arab.	Nd	Unknown	Unknown
Family Scatophagidae			
Genus Scatophagus			
77. <i>Scatophagus argus</i> KBA: Reported from the Shatt al Arab, Hammar Marsh and the Euphrates River near Chabaish).	Nd	Unknown	Unknown
Family Stromateidae			
Genus Pampus			
78. <i>Pampus argenteus</i> KBA: Recorded from the Shatt al Arab and the Hammar Marsh.	Nd	Unknown	Unknown
79. <i>Pampus chinensis</i> : Recorded in the literature from the Shatt al Arab and the Hammar Marsh.	Nd	Unknown	Unknown
Family Soleidae			
Genus Brachirus			
80. <i>Brachirus orientalis</i> KBA: Reported in the literature from the Shatt al Arab and the Hammar Marsh.	Nd	Unknown	Unknown

Additional Notes by Nature Iraq:

¹ Every year there is a *Tenuulosa Ilisba* catch. The bulk come in early spring for spawning but oil pollution in the Shatt Al Arab has disturbed its spawning ground (Al-Saad *et al.*, 2008 in press).

² From preliminary surveys in Kurdistan, Northern Iraq this species may be less threatened than in the south of Iraq.

³ *Cobitis taenia*, the Spiny Loach, was seen in the 2007 survey in Hawizeh along with another species in this family known as the Golden Loach (*Sabanejewia aurata* (De Filippi, 1863)).

⁴ *Liza abu* is the dominate fish in terms of numbers in all southern KBA sites.

⁵ *Acanthopagrus latus*, the Yellowfin Seabream, is found in East Hammar marsh where it spawns and feeds.

Annex D: Pictures of Some Key Fish Species and Issues of Kurdistan, Northern Iraq

Note: Photos by Haider Ibrahim unless noted



Cyprinion macrostumum at Darbandikhan Lake (S1), Winter 2008



Barbus xanthopterus at Mosul Lake (D10)



Barbus esocinus at Dukan Lake (S2), Winter 2008



Barbus xanthopterus at Darbandikhan Lake (S1), Winter 2008



Ctenopharyngodon idella at Darbandikhan Lake (S1), Winter 2008



Cyprinus carpio at Mosul Lake (D10), Winter 2008



Hypophthalmichthys nobilis, Winter 2008



Silurus triostegus at Mosul Lake (D10), Winter 2008



Police officer with confiscated fishing nets at Darbandikhan Lake, Summer 2008 (Photo by Ibrahim A Abd)



Fish market in Dukan (Winter 2008)



Interviewing sellers at the Kalar Fish Market in Winter 2008 (Photo by A. Bachmann)



Fish Survey team in Atrush (D3), Summer 2008



Fisherman at Mosul Lake (D10), Winter 2008



Fisherman at Bahraka (E11), Winter 2008

Annex E: Plant list of plants seen on the KBA Surveys for Kurdistan, Northern Iraq

Scientific name	Common name	Family-scientific	Source
<i>Acantholimon sorbhenes</i>	Smooth-leaved Acanthus	Plumbaginaceae	Flora of Iran
<i>Acer monspessulanum</i>		Aceraceae	Flora of Iraq
<i>Abelmoschus esculentus</i>		Malvaceae	Flora of Iraq
<i>Acanthus dioscoridis</i>		Acanthaceae	A Dictionary of Kurdistan Medicinal Plant
<i>Achillea filipendula</i>	Yarrow	Umblefera	Flora of Iran
<i>Achillea eriophora</i>		Umblefera	Flora of Iran
<i>Acroptilon picris</i>		Compositae	Flora of Iran
<i>Adiantum capillus-veneris</i>	Maidenhair Fern	Pteridaceae	Flora of Iraq
<i>Adiantum sp</i>		Pteridaceae	Flora of Iraq
<i>Aegilops columnaria</i>		Poaceae	Flora of Iraq
<i>Aegilops crassa</i>		Poaceae	Flora of Iraq
<i>Aegilops sp</i>	Goatgrass	Poaceae	Flora of Iraq
<i>Aegilops speltoides</i>		Poaceae	Flora of Iraq
<i>Aegilops cylindrica</i>		Poaceae	Flora of Iraq
<i>Aegilops triuncialis</i>		Poaceae	Flora of Iraq
<i>Agoseris cuspidata</i>	Prairie Dandelion	Compositae	Flora of Iraq
<i>Agrimonia eupatoria</i>		Compositae	Flora of Iraq
<i>Alcea hircana</i>		Malvaceae	Flora of Iraq
<i>Alcea kurdica</i>		Malvaceae	Flora of Iraq
<i>Alcea officinalis</i>		Malvaceae	Flora of Iraq
<i>Alcea tholozani</i>		Malvaceae	Flora of Iran
<i>Alcea sp</i>		Malvaceae	Flora of Iraq
<i>Alhagi maurorum</i>	Camelthorn	Fabaceae	Flora of Iraq
<i>Alkanna sp</i>		Boraginaceae	National herbarium of Iraq
<i>Allium sativa</i>	Wild Onion	Liliaceae	Flora of Iraq
<i>Allium stamineum</i>		Liliaceae	Flora of Iraq
<i>Allium sp</i>		Liliaceae	Flora of Iraq
<i>Alyssum sp</i>		Brassicaceae	Flora of Iraq
<i>Ammi majus</i>		Umblefera	National herbarium of Iraq
<i>Ammi sp</i>		Umblefera	National herbarium of Iraq
<i>Anagallis arvensis</i>		Primulaceae	Flora of Iraq
<i>Anagallis sp</i>		Primulaceae	Flora of Iraq
<i>Anagyris foetida</i>	Stinking Bean	Fabaceae	Flora of Iraq
<i>Anchusa italica</i>	Italian Bugloss	Boraginaceae	National herbarium of Iraq
<i>Anchusa sp</i>		Boraginaceae	National herbarium of Iraq
<i>Andrachne aspera</i>		Euphorbiaceae	Flora of Iraq
<i>Anthemis altissima</i>		Compositae	Flora of Iran
<i>Anthemis arvensis</i>	Corn Chamomile	Compositae	Flora of Iran
<i>Anthemis sp</i>		Compositae	Flora of Iran
<i>Anthemis tinctoria</i>	Yellow Chamomile	Compositae	Flora of Iran
<i>Arctium lappa</i>		Compositae	Flora of Iran
<i>Aristolochia tomentosa</i>		Aristolochiaceae	Flora of Iraq
<i>Aristolochia sp</i>		Aristolochiaceae	Flora of Iraq
<i>Artodia sp</i>		Umblefera	National herbarium of Iraq
<i>Astragalus sp</i>		Fabaceae	Flora of Iraq
<i>Astragalus bolopsilus</i>		Fabaceae	Flora of Iran
<i>Astragalus keirindicus</i>		Fabaceae	Flora of Iraq
<i>Astragalus spinosus</i>	Spiny Milkvetch	Fabaceae	Flora of Iraq
<i>Astragalus myricanthus</i>		Fabaceae	Flora of Iraq
<i>Asteragalus russelii</i>		Fabaceae	Flora of Iraq
<i>Astragalus verticillatus</i>		Papilionaceae	Flora of Iran
<i>Blackstonia perfoliata</i>		Caryophyllaceae	Photographic Guide to wild flowers of Lebanon
<i>Avena fatua</i>	Wild Oat	Poaceae	Flora of Iraq
<i>Avena sp</i>		Poaceae	Flora of Iraq
<i>Avena wiestii</i>		Poaceae	Flora of Iran
<i>Bellevalia kurdistanica</i>		Liliaceae	Flora of Iraq

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Scientific name	Common name	Family-scientific	Source
<i>Bellevallia sp</i>		Liliaceae	Flora of Iraq
<i>Biscutella ciliata</i>	Pagoda Plant	Brassicaceae	Flora of Iraq
<i>Boissiera squarrosa</i>		Poaceae	Flora of Iraq
<i>Brassica kaber</i>		Brassicaceae	Flora of Iran
<i>Brassica napus</i>	Rape	Brassicaceae	Flora of Iraq
<i>Brassica tournefortii</i>		Brassicaceae	Flora of Iran
<i>Brassica sp</i>		Brassicaceae	Flora of Iraq
<i>Bromus danthoniae</i>		Poaceae	Flora of Iraq
<i>Bromus sp</i>		Poaceae	Flora of Iraq
<i>Buffonia oliveriana</i>		Caryophyllaceae	Flora of Iran
<i>Calendula arvensis</i>		Compositae	Flora of Iran
<i>Calendula sp</i>		Compositae	Flora of Iran
<i>Carex sp</i>		Cyperaceae	Flora of Iraq
<i>Calystegia sepium</i>		Convolvulaceae	Wildflowers of the Pacific Northwest
<i>Campanula cecillii</i>		Campanulaceae	Flora of Iran
<i>Campanula gilliatii</i>		Campanulaceae	Flora of Iran
<i>Campanula phytidocalyx</i>		Campanulaceae	
<i>Campanula sp</i>		Campanulaceae	Flora of Iran
<i>Capparis spinosa</i>	Caper Bush	Capparaceae	Flora of Iraq
<i>Capsella bursa-pastoris</i>		Brassicaceae	Flora of Iraq
<i>Cardamine breveri</i>		Brassicaceae	Wildflowers of the Pacific Northwest
<i>Cardaria draba</i>		Brassicaceae	Wildflowers of the Pacific Northwest
<i>Carduncellus pinnatus</i>		Composite	Flora of Iran
<i>Carduus pycnocephalus</i>	Italian Thistle	Composite	Flora of Kuwait
<i>Carduus sp</i>		Composite	Flora of Kuwait
<i>Carthamus oxyacanthus</i>	Wild Safflower	Compositae	Flora of Kuwait
<i>Carthamus sp</i>		Compositae	Flora of Kuwait
<i>Cedrus libani</i>	Lebanese Cedar	Pinaceae	
<i>Centaurea beben</i>		Compositae	Flora of Iran
<i>Centaurea bryguierana</i>		Compositae	Flora of Kuwait
<i>Centaurea iberica</i>	Iberian Star Thistle	Compositae	Flora of Iran
<i>Centaurea irritans</i>		Compositae	Flora of Iran
<i>Centaurea macrocephala</i>		Compositae	Flora of Iran
<i>Centurea montana</i>		Compositae	Flora of Iran
<i>Centaurea pseudosinaica</i>		Compositae	Flora of Kuwait
<i>Centaurea urvillei</i>		Compositae	Flora of Iran
<i>Centaurea solistitalis</i>		Compositae	Photographic Guide to wild flowers of Lebanon
<i>Centaurea sp</i>		Compositae	Flora of Iran
<i>Centaurea virgata</i>		Compositae	Flora of Iran
<i>Centurea cheiranthifolia</i>		Compositae	Flora of Iran
<i>Cephalaria dichaeophora</i>		Dipsacaceae	National herbarium of Iraq
<i>Cephalaria sp</i>		Dipsacaceae	National herbarium of Iraq
<i>Cephalaria syriaca</i>		Dipsacaceae	National herbarium of Iraq
<i>Cerastium sp</i>		Caryophyllaceae	National herbarium of Iraq
<i>Ceratophyllum sp</i>	Hornwort	Hatoragaceae	Flora of Iran
<i>Cercis siliquastrum</i>	Judas Tree	Caesalpiniaceae	
<i>centaurium sp</i>		Gentianaceae	Photographic Guide to wild flowers of Lebanon
<i>Chinopodium sp</i>	Goosefoot	Chinopodiaceae	
<i>Cicer anatolicum</i>		Fabaceae	Flora of Iraq
<i>Chondrilla juncea</i>		Compositae	Flora of Iran
<i>Cichorium intybus v.album</i>		Compositae	Flora of Iran
<i>Cichorium sp</i>		Compositae	Flora of Iran
<i>Cirsium sp.</i>		Compositae	Flora of Iran
<i>Cirsium vulgare</i>		Compositae	Flora of Iran
<i>Citrullus colocynthis</i>		Cucurbitaceae	Flora of Iraq
<i>Clinopodium vulgare</i>		Labiatae	Flora of Iran
<i>Colchium kotschyi</i>		Liliaceae	Flora of Iraq
<i>Convolvulus arvensis</i>	Field Bindweed	Convolvulaceae	National herbarium of Iraq
<i>Convolvulus betonicifolium</i>		Convolvulaceae	Flora of Iraq
<i>Convolvulus sericeus</i>		Convolvulaceae	Flora of Iraq

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Scientific name	Common name	Family-scientific	Source
<i>Convolvulus sepium</i>	Hedge Bindweed	Convolvulaceae	Flora of Iraq
<i>Convolvulus sp</i>		Convolvulaceae	Flora of Iraq
<i>Conyza bonariensis</i>		Convolvulaceae	Flora of Iraq
<i>Conyza canadensis</i>	Horseweed	Compositae	Flora of Iraq
<i>Conyza sp</i>		Compositae	Flora of Iraq
<i>Clinopodium vulgare</i>		Lamiaceae	Flora of Iraq
<i>Cotula sp</i>		Compositae	Flora of Iraq
<i>Cousinia sp</i>		Compositae	Flora of Iraq
<i>Cousinia odontolepis</i>		Compositae	National herbarium of Iraq
<i>Cousinia Khorramabadensis</i> <i>var. purpurea</i>		Compositae	Flora of Iraq
<i>Cousinia mobayenii</i>		Compositae	Flora of Iraq
<i>Cousinia rhabdiostegia</i>		Compositae	Flora of Iraq
<i>Crataegus monogyna</i>		Rosaceae	National herbarium of Iraq
<i>Crataegus sp</i>		Rosaceae	National herbarium of Iraq
<i>Crepis capillaris</i>		Compositae	
<i>Cuscuta sp</i>		Cuscutaceae	National herbarium of Iraq
<i>Cymbopogon olivieri</i>		Poaceae	Flora of Iraq
<i>Cynodon dactylo</i>	Bermuda Grass	Poaceae	Flora of Iraq
<i>Cynoglossum creticum</i>		Boraginaceae	Flora of Iran
<i>Cyperus difformis</i>		Cyperaceae	Flora of Iraq
<i>Cyperus esculentus</i>	Yellow Nutsedge	Cyperaceae	Flora of Iraq
<i>Cyperus iupulimum</i>		Cyperaceae	Flora of Iraq
<i>Cyperus rotundus</i>	Nutgrass	Cyperaceae	Flora of Iraq
<i>Chrozophora tinctoria</i>		Brassicaceae	Flora of Iraq
<i>Cyperus sp</i>		Cyperaceae	Flora of Iraq
<i>Dactylis glomerata</i>	Orchard Grass	Poaceae	Flora of Iraq
<i>Datisca cannabina</i>		Datisceae	Flora of Iraq
<i>Datura innoxia</i>		Solanaceae	Flora of Iran
<i>Datura stramonium</i>		Solanaceae	Flora of Iran
<i>Delphinium consolida</i>	Forking Larkspur	Ranunculaceae	Flora of Iran
<i>Delphinium nuttalli</i>		Ranunculaceae	Flora of Iran
<i>Delphinium sp</i>		Ranunculaceae	Flora of Iran
<i>Dianthus basianica</i>	Dianthus	Caryophyllaceae	Asystematic Study of <i>Dianthus</i> L. (Caryophyllaceae) Taxa in Iraqi Kurdistan. Univercity of Sulaimani.
<i>Dianthus floribundus</i>		Caryophyllaceae	Asystematic Study of <i>Dianthus</i> L. (Caryophyllaceae) Taxa in Iraqi Kurdistan. Univercity of Sulaimani.
<i>Dianthus orientalis</i>	Clove Pinkn	Caryophyllaceae	Asystematic Study of <i>Dianthus</i> L. (Caryophyllaceae) Taxa in Iraqi Kurdistan. Univercity of Sulaimani.
<i>Dianthus pendulus</i>	Pendulus Dianthus	Caryophyllaceae	Asystematic Study of <i>Dianthus</i> L. (Caryophyllaceae) Taxa in Iraqi Kurdistan. Univercity of Sulaimani.
<i>Dianthus strictus</i>	Strict Dianthus	Caryophyllaceae	Asystematic Study of <i>Dianthus</i> L. (Caryophyllaceae) Taxa in Iraqi Kurdistan. Univercity of Sulaimani.
<i>Dianthus zonata</i>		Caryophyllaceae	Asystematic Study of <i>Dianthus</i> L. (Caryophyllaceae) Taxa in Iraqi Kurdistan. Univercity of Sulaimani.
<i>Dianthus zonata Var zonata</i>		Caryophyllaceae	Asystematic Study of <i>Dianthus</i> L. (Caryophyllaceae) Taxa in Iraqi Kurdistan. Univercity of Sulaimani.
<i>Dichanthium annulatum</i>		Pocaceae	Flora of Iraq

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Scientific name	Common name	Family-scientific	Source
<i>Dionysia sp</i>		Primulaceae	Flora of Iran
<i>Digitaria sanguinalis</i>		poaceae	Weed of southern turf grasses for to identify plant
<i>Digitaria sp</i>		poaceae	Weed of southern turf grasses for to identify plant
<i>Dipsacus laciniatus</i>		Dipsacaceae	
<i>Echinops cyanocephalus</i>		Compositae	Flora of Iran
<i>Echinops heteromorphus</i>		Compositae	Flora of Iran
<i>Echinops pungens</i>		compositae	Flora of Iran
<i>Echinops sp</i>	Globe Thistle	Compositae	Flora of Iran
<i>Echium italicum</i>		Boraginaceae	Flora of Iran
<i>Echium sp</i>		Boraginaceae	Flora of Iran
<i>Eclipta alba</i>	False Daisy	poaceae	Missouri plant
<i>Ephedra foliata</i>		Ephedraceae	
<i>Epilobium hirsutum</i>	Hairy Willowherb		Flora of Iran
<i>Epilobium sp</i>		Onagraceae	Missouri plant
<i>Equisetum ramosissimum</i>		Equisetaceae	Flora of Iraq
<i>Equisetum arvense</i>		Equisetaceae	Flora of Iraq
<i>Erodium cicutarium</i>		Geraniaceae	Flora of Iran
<i>Eruca sativa</i>		Brassicaceae	Flora of Iran
<i>Eryngium caeruleum</i>		Compositae	Flora of Iran
<i>Eryngium pyramidale</i>		Apiaceae	Flora of Iran
<i>Eryngium sp</i>		Apiaceae	Flora of Iran
<i>Encalyptus glauca</i>	White Eucalyptus	Myrtaceae	Flora of Iraq
<i>Euphorbia boissieriana</i>		Euphorbiaceae	Flora of Iran
<i>Euphorbia helioscopia</i>	Sunspurge	Euphorbiaceae	Flora of Iran
<i>Euphorbia persicum</i>		Euphorbiaceae	Flora of Iraq
<i>Euphorbia schillingii</i>	Spurge	Euphorbiaceae	Flora of Iran
<i>Euphorbia indica</i>		Euphorbiaceae	Flora of Iraq
<i>Euphorbia sp</i>		Euphorbiaceae	Flora of Iraq
<i>Ferulago angulata</i>		Umblefera	A Dictionary of Kurdistan Medicinal Plant
<i>Fibigia macrocarps</i>		Brassicaceae	Flora of Iran
<i>Ficus carica</i>	Common Fig	Moraceae	Flora of Iraq
<i>Ficus hispida</i>	Hairy Fig	Moraceae	Flora of Iraq
<i>Fimbristylis autumnalis</i>	Slender Fimbry	Cyperaceae	Flora of Iraq
<i>Fimbristylis bisumbellata</i>		Cyperaceae	Flora of Iraq
<i>Foeniculum officinale</i>	Sweet Fennel	Umblefera	National herbarium of Iraq
<i>Fraxinus rotundifolia</i>	Round-leaved Ash	Oleaceae	Flora of Iraq
<i>Galium sp</i>	Bedstraw	Rubiaceae	Flora of Iran
<i>Gastrocotyle hispida</i>		Boraginaceae	Flora of Iran
<i>Geum urbanum</i>		Rosaceae	Flora of Iran
<i>Geranium sp</i>		Geraniaceae	Flora of Iran
<i>Gladiolus atroviolaceae</i>		Iridaceae	Flora of Iraq
<i>Gladiolus italicus</i>		Iridaceae	Flora of Iraq
<i>Gladiolus sp</i>		Iridaceae	Flora of Iraq
<i>Glancium corniculatum</i>		papaveraceae	Flora of Iraq
<i>Glycyrrhiza glabra</i>	Licorice Root	Papilinaceae	Flora of Iraq
<i>Gossypum sp</i>	Wild Cotton	Malvaceae	Flora of Iraq
<i>Gundell tournefortii</i>		Compositae	A Dictionary of Kurdistan Medicinal Plant
<i>Gypsophila bicolor</i>		Caryophyllaceae	Flora of Iran
<i>Gypsophila sp</i>		Caryophyllaceae	Flora of Iran
<i>Hedera helix</i>		Araliaceae	Flora of Iran
<i>Helianthus annus</i>	Sunflower	Compositae	National herbarium of Iraq
<i>Helianthus tuberosus</i>		Compocetae	National herbarium of Iraq
<i>Helicbrysum armenium</i>		Compositae	Flora of Iran
<i>Heliotropium indicum</i>	Indian Heliotrope	Campanulaceae	Flora of Iran
<i>Heliotropium sp</i>		Campanulaceae	Flora of Iran
<i>Hordeum bulbosum</i>		Poaceae	Flora of Iraq
<i>Hordeum glaucum</i>		Poaceae	Flora of Iraq
<i>Hordeum spontanum</i>		Poaceae	Flora of Iraq
<i>Hordeum sp</i>		Poaceae	Flora of Iraq

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Scientific name	Common name	Family-scientific	Source
<i>Hymenocrater longiflorus</i>		Labiatae	Flora of Iran
<i>Hyoscyamus niger</i>		Solanaceae	National herbarium of Iraq
<i>Hypericum perforatum</i>	St. Johnswort	Hypericaceae	Flora of Iraq
<i>Hypericum scabrum</i>		Hypericaceae	Flora of Iran
<i>Hypericum sp.</i>		Hypericaceae	Flora of Iraq
<i>Imperata cylindrica</i>	Bloodgrass	Poaceae	Flora of Iraq
<i>Imperata sp.</i>		Poaceae	Flora of Iraq
<i>Isatis cochlearis</i>		Brassicaceae	Flora of Iran
<i>Ixiolirion tataricum</i>		Amarylidaceae	Flora of Iraq
<i>Juglans regia</i>	Persian Walnut	Juglandaceae	Flora of Iraq
<i>Juniperus oxycedrus</i>	Prickly Juniper	Cupressaceae	Flora of Iraq
<i>juncus acutus</i>		Juncaceae	Flora of Iraq
<i>Juncus bufonius</i>		Juncaceae	Flora of Iraq
<i>Juncus effusus</i>	Common Rush	Juncaceae	Flora of Iraq
<i>Juncus sp.</i>		Juncaceae	Flora of Iraq
<i>Lactuca serriola</i>		Compositae	
<i>Lactuca sp.</i>		Compositae	
<i>Lamium sp.</i>	Deadnettle	Labiatae	Flora of Iran
<i>Lathyrus chloranthus</i>		Fabaceae	Photographic Guide to wild flowers of Lebanon
<i>Lathyrus sp.</i>		Fabaceae	Photographic Guide to wild flowers of Lebanon
<i>Launaea mucronata</i>		Compositae	Wildflowers of the Pacific Northwest
<i>Launaea sp.</i>		Compositae	Wildflowers of the Pacific Northwest
<i>Legousia sp.</i>		Campanulaceae	Photographic Guide to wild flowers of Lebanon
<i>Leontice minor</i>		Berberidaceae	A Dictionary of Kurdistan Medicinal Plant
<i>Linum nodiflorum</i>		Linaceae	Flora of Iraq
<i>Linum velutinum</i>		Linaceae	Flora of Iraq
<i>Linum sp.</i>		Linaceae	Flora of Iraq
<i>Lolium temulentum</i>		Poaceae	Flora of Iraq
<i>Lotus halophilus</i>		Fabaceae	Photographic Guide to wild flowers of Lebanon
<i>Lythrum hyssopifolium</i>		Lythraceae	Flora of Iran
<i>Lythrum salicaria</i>	Purple Loosestrife	Lythraceae	Flora of Iran
<i>Malva aegyptiaca</i>		Malvaceae	Flora of Iraq
<i>Malva neglecta</i>		Malvaceae	Flora of Iraq
<i>Malva parviflora</i>	Small-flowered Malloy	Malvaceae	Flora of Iraq
<i>Malva sp.</i>		Malvaceae	Flora of Iraq
<i>Marrubium sp.</i>		Labiatae	Flora of Iran
<i>Matricaria chamomilla</i>		Compositae	Flora of Iran
<i>Michauxia sp.</i>		Campanulaceae	National herbarium of Iraq
<i>Medicago sativa</i>		Fabaceae	Flora of Iraq
<i>Medicago sp.</i>		Fabaceae	Flora of Iraq
<i>Melia azedarach</i>		Meliaceae	Flora of Iraq
<i>Mentha sativa</i>	Alfalfa	Labiatae	National herbarium of Iraq
<i>Mentha sp.</i>		Labiatae	National herbarium of Iraq
<i>Molucella laevis</i>		Labiatae	Photographic Guide to wild flowers of Lebanon
<i>Morus alba</i>	White Mulberry	Moraceae	Flora of Iraq
<i>Morus nigra</i>	Black Mulberry	Moraceae	Flora of Iraq
<i>Morus rubra</i>	Red Mulberry	Moraceae	Flora of Iraq
<i>Myriophyllum sp.</i>	Water Milfoil	Haloragidaceae	Flora of Iraq
<i>Nasturtium officinale</i>		Brassicaceae	Photographic Guide to wild flowers of Lebanon
<i>Nasturtium sp.</i>		Brassicaceae	Photographic Guide to wild flowers of Lebanon
<i>Nerium oleander</i>	Oleander	Apocynaceae	Flora of Iraq
<i>Nerium sp.</i>		Apocynaceae	Flora of Iraq
<i>Nitella sp.</i>		Characeae	
<i>Nigella oxypetala</i>		Ranunculaceae	Flora of Iran

Scientific name	Common name	Family-scientific	Source
<i>Nigella sativa</i>		Ranunculaceae	Flora of Iran
<i>Notobasis syriaca</i>		Compositae	Photographic Guide to wild flowers of Lebanon
<i>Olea eurocarpa</i>	Olive	Oleaceae	Flora of Iraq
<i>Oliveria decumbens</i>		Umbelifera	Flora of Iran
<i>Ononis spinosa</i>		Fabaceae	Flora of Iraq
<i>Onopordon acanthium</i>		Compositae	Photographic Guide to wild flowers of Lebanon
<i>Onopordon sp</i>		Compositae	Photographic Guide to wild flowers of Lebanon
<i>Onosma albo-roseum</i>		Boraginaceae	A Comparative Systematic Study of <i>Onosma</i> L. Spp. (Boraginaceae) in Iraq. Univercity of Baghdad.
<i>Onosma asperrimum</i>		Boraginaceae	A Comparative Systematic Study of <i>Onosma</i> L. Spp. (Boraginaceae) in Iraq. Univercity of Baghdad.
<i>Onosma auriculatum</i>		Boraginaceae	A Comparative Systematic Study of <i>Onosma</i> L. Spp. (Boraginaceae) in Iraq. Univercity of Baghdad.
<i>Onosma kotschyi</i>		Boraginaceae	A Comparative Systematic Study of <i>Onosma</i> L. Spp. (Boraginaceae) in Iraq. Univercity of Baghdad.
<i>Onosma macrophyllum</i>		Boraginaceae	A Comparative Systematic Study of <i>Onosma</i> L. Spp. (Boraginaceae) in Iraq. Univercity of Baghdad.
<i>Onosma rostellatum</i>		Boraginaceae	A Comparative Systematic Study of <i>Onosma</i> L. Spp. (Boraginaceae) in Iraq. Univercity of Baghdad.
<i>Onosma sp</i>	Onosma	Boraginaceae	A Comparative Systematic Study of <i>Onosma</i> L. Spp. (Boraginaceae) in Iraq. Univercity of Baghdad.
<i>Ophrys sp</i>		Orchidaceae	Flora of Iraq
<i>Ornithogalum persicum</i>		Liliaceae	Flora of Iraq
<i>Ornithogalum sp</i>		Liliaceae	Flora of Iraq
<i>Outreya carduiiformi</i>		Compositae	Flora of Iran
<i>Orchis sp</i>		Orchidaceae	Flora of Iraq
<i>Orobanche Sp</i>	Broomrape	Orobancheaceae	National herbarium of Iraq
<i>Paliurus spinachristi</i>		Rhamnaceae	Flora of Iraq
<i>Panicum maximum</i>		Poaceae	Flora of Iraq
<i>Papaver fugax</i>		Papaveraceae	Flora of Iraq
<i>Papaver sp</i>		Papaveraceae	Flora of Iraq
<i>Paracaryum intermedium</i>		Boraginaceae	Flora of Iran
<i>Pedicularis sp</i>		Scrophulariaceae	Flora of Iran
<i>Peganum harmala</i>		Zygophyllaceae	Flora of Iraq
<i>Periploca graeca</i>		Apocynaceae	Flora of Iraq
<i>Phagnalon rupestre</i>		Compositae	Flora of Iran
<i>Pennisetum orientale</i>		Poaceae	Flora of Iraq
<i>Phalaris sp</i>		Poaceae	Flora of Iraq
<i>Phlomis bruguieri</i>		Labiatae	Flora of Iran
<i>Phlomis herbaventi</i>		Labiatae	Flora of Iran
<i>Phlomis olivieri</i>		Labiatae	Flora of Iran
<i>Phlomis rigida</i>		Labiatae	Flora of Iran
<i>Phlomis sp</i>		Labiatae	Flora of Iran
<i>Pbleum exaratum</i>		Poaceae	Flora of Iran
<i>Picnomon acarna</i>		Compositae	Flora of Iran

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Scientific name	Common name	Family-scientific	Source
<i>Pimpinella kotschyana</i>		Umblefera	Flora of Iran
<i>Phragmites communis</i>	Common Reed	Poaceae	Flora of Iraq
<i>Pinus halepensis var. brutia</i>	Calabrian Pine	Pinaceae	Flora of Iraq
<i>Pinus pinea</i>	Italian Stone Pine	Pinaceae	Flora of Iraq
<i>Pisum formosum</i>		Fabaceae	Flora of Iraq
<i>Pisum sp</i>		Fabaceae	Flora of Iraq
<i>Pinus sp</i>		Pinaceae	Flora of Iraq
<i>Pistacia Kbinjuk</i>		Anacardidaceae	Flora of Iraq
<i>Pistatacia eurycarpa</i>	Pistacia	Anacardidaceae	Flora of Iraq
<i>Plantago lanceolata</i>	Narrowleaf Plantain	Plantaginaceae	Photographic Guide to wild flowers of Lebanon
<i>Plantago major</i>		Plantaginaceae	Wildflowers of the Pacific Northwest
<i>Plantago virginica</i>	Virginia Plantain	Plantaginaceae	Missouri plant
<i>Platanus orientalis</i>		platanaceae	Flora of Iraq
<i>Poa bulbosa</i>	Bulbous bluegrass	Poaceae	Flora of Iraq
<i>Poa sp</i>		Poaceae	Flora of Iraq
<i>Polygonum aviculare</i>		polygonaceae	Wildflowers of the Pacific Northwest
<i>Polygonum pensylvanicum</i>	Pennsylvania Smartweed	polygonaceae	Missouri plant
<i>Polygonum persicaria</i>	<i>Polygonum persicaria</i>	polygonaceae	Wildflowers of the Pacific Northwest
<i>Polygonum sp</i>		Polygonaceae	Wildflowers of the Pacific Northwest
<i>Potentilla hirta</i>		Rosaceae	Flora of Iraq
<i>Populus alba</i>	White Poplar	Salicaceae	Flora of Iraq
<i>Populus euphratica</i>	Euphrates Poplar	Salicaceae	Flora of Iraq
<i>portulaca oleracea</i>	Little Hogweed	Portulacaceae	Flora of Iraq
<i>Postia puberula</i>		Compositae	Flora of Iran
<i>Potamogeton crispus</i>		Potamogetonaceae	
<i>Potamogeton luence</i>		Potamogetonaceae	
<i>Potamogeton nodosus</i>		Potamogetonaceae	
<i>Potamogeton pectinatus</i>	Sago Pondweed	Potamogetonaceae	
<i>Potamogeton perfoliatus</i>		Potamogetonaceae	
<i>Potamogeton luence</i>		Potamogetonaceae	
<i>Primula sp</i>		Primulaceae	National herbarium of Iraq
<i>Prosopis farcta</i>	Syrian mesquite	Fabaceae	Flora of Iraq
<i>Prunus sp</i>		Rosaceae	Acomparative Systematic Study of <i>Prunus</i> L. (Rosaceae) in Iraq. University of Mousl.
<i>Prunus amygdalis</i>	Almond	Rosaceae	Acomparative Systematic Study of <i>Prunus</i> L. (Rosaceae) in Iraq. University of Mousl.
<i>Prunus amygdalis var. amara</i>		Rosaceae	Acomparative Systematic Study of <i>Prunus</i> L. (Rosaceae) in Iraq. University of Mousl.
<i>Prunus armenica</i>		Rosaceae	Acomparative Systematic Study of <i>Prunus</i> L. (Rosaceae) in Iraq. University of Mousl.
<i>Prunus microcarpus</i>	Small-seed Plum	Rosaceae	Acomparative Systematic Study of <i>Prunus</i> L. (Rosaceae) in Iraq. University of Mousl.
<i>Prunus orientalis</i>		Rosaceae	Acomparative Systematic Study of <i>Prunus</i> L. (Rosaceae) in Iraq. University of Mousl.
<i>Prunus persica</i>	Peach	Rosaceae	Acomparative Systematic Study of <i>Prunus</i> L. (Rosaceae) in Iraq. University of Mousl.
<i>Psilurus incurvus</i>		poaceae	Flora of Iraq
<i>Pterocephalus sp</i>		Dipsacaceae	Flora of Iraq
<i>pterypyrum olivieri</i>		polygonaceae	Flora of Iran
<i>Punica granatum</i>	Pomegranate	Punicaceae	Flora of Iraq
<i>Pyrus communis</i>	Pear	Rosaceae	National herbarium of Iraq
<i>Pyrus domestica</i>		Rosaceae	National herbarium of Iraq
<i>Pyrus malus</i>	Apple	Rosaceae	National herbarium of Iraq

Scientific name	Common name	Family-scientific	Source
<i>Pyrus persica</i>		Rosaceae	National herbarium of Iraq
<i>Pyrus sp</i>		Rosaceae	National herbarium of Iraq
<i>Quercus aegilops</i>	Valonia Oak	Fagaceae	Flora of Iraq
<i>Quercus infectoria</i>	Aleppo Oak	Fagaceae	Flora of Iraq
<i>Quercus libani</i>	Lebanon Oak	Fagaceae	Flora of Iraq
<i>Quercus macranthera</i>		Fagaceae	Flora of Iraq
<i>Quercus sp</i>		Fagaceae	Flora of Iraq
<i>Ranunculus aucheri</i>		Ranunculaceae	Flora of Iraq
<i>Ranunculus repens</i>		Ranunculaceae	Flora of Iraq
<i>Ranunculus sp</i>		Ranunculaceae	Flora of Iraq
<i>Reseda aucheri</i>		Resedaceae	Flora of Iran
<i>Rhus coriaria</i>		Anacardiaceae	Flora of Iraq
<i>Ricinus communis</i>		Euphorbiaceae	Flora of Iraq
<i>Rosa beggeriana</i>		Rosaceae	Flora of Iran
<i>Rosa eglanteria</i>		Rosaceae	Wildflowers of the Pacific Northwest
<i>Rosa foetida</i>		Rosaceae	A Dictionary of Kurdistan Medicinal Plant
<i>Rosa gallica</i>	French Rose	Rosaceae	Flora of Iraq
<i>Rosa sp</i>		Rosaceae	Flora of Iraq
<i>Rubus caesius</i>	Elm-leaved Sumac	Rosaceae	Flora of Iraq
<i>Rubus sanctus (R. anatolicus)</i>		Rosaceae	Flora of Iraq
<i>Rubus sp</i>		Rosaceae	Flora of Iraq
<i>Ricinus communis</i>	Castor Bean	Euporbiaceae	Flora of Iraq
<i>Rumex sp</i>		polygonaceae	Flora of Iran
<i>Rumex crispus</i>		Polygonaceae	Flora of Iran
<i>Rumex hastatula</i>	Heartwing Sorrel	polygonaceae	A Dictionary of Kurdistan Medicinal Plant
<i>Rumex scutatus</i>	French Sorrel	polygonaceae	Flora of Iran
<i>Rumex sp</i>		polygonaceae	Flora of Iran
<i>Salix acmophylla</i>	Willow	Salicaceae	Flora of Iraq
<i>Salix aegyptiaca</i>	Mediterranean Willow	Salicaceae	Flora of Iraq
<i>Salix babylonica</i>	Pincushion Flower	Salicaceae	Flora of Iraq
<i>Salix sp</i>		Salicaceae	Flora of Iraq
<i>Salvadora oleoides</i>		Salvadoraceae	Flora of Iran
<i>Salvia palaestina</i>		Labiatae	Flora of Iran
<i>Salvia sp</i>		Labiatae	Flora of Iran
<i>Scabiosa macrochaeta</i>		Dapsacaceae	Morphological-Systematic Study of The Genus Scabiosa L.(Dipsacaceae) in Kurdistan of Iraq,University of Salahadin-Erbil.
<i>Scandix pecten-veneris</i>		Umblefera	Flora of Iran
<i>Scirpoidis holoschoenus</i>		Juncaceae	Flora of Iraq
<i>Schoenoplectus litoralis</i>		Cyperaceae	Flora of Iraq
<i>Schoenoplectus sp</i>		Cyperaceae	Flora of Iraq
<i>Scleria ciliata</i>		?	Missouri plant
<i>Scorpiurus sulcata</i>		Fabaceae	Flora of Iraq
<i>Scrophularia deserti</i>		Scrophulariaceae	Flora of Iran
<i>Scrophularia sp.</i>		Scrophulariaceae	Flora of Iran
<i>Scorzonera sp</i>		Compositae	Flora of Iran
<i>Scutellaria tournefortii</i>		Labiatae	
<i>Securigera securidaca</i>		Fabaceae	Flora of Iran
<i>Sideritis libanotica</i>		Lamiaceae	Photographic Guide to wild flowers of Lebanon
<i>Serratula cerinthifolia</i>		Compositae	Photographic Guide to wild flowers of Lebanon
<i>Serratula grandifolia</i>		Compositae	Flora of Iran
<i>Serratula latifolia</i>		Compositae	Flora of Iran
<i>Serratula sp</i>		Compositae	Flora of Iran
<i>Sesamum indicum</i>		Pedaliaceae	Flora of Iraq
<i>Setaria verticillata</i>		poaceae	Missouri plant
<i>Silene aucheriana</i>		Caryophyllaceae	Flora of Iran

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Scientific name	Common name	Family-scientific	Source
<i>Silene linearis</i>		Caryophyllaceae	Flora of Iran
<i>Silene morganae</i>		Caryophyllaceae	Flora of Iran
<i>Silen sp</i>		Caryophyllaceae	Flora of Iran
<i>Silybum marianum</i>		Compositae	Flora of Iran
<i>Solanum crispum</i>		Solanaceae	
<i>Sonchus oleraceus</i>		Compositae	Flora of Iran
<i>Sonchus sp</i>		Compositae	Flora of Iran
<i>Sorghum sp</i>		Poaceae	Flora of Iraq
<i>Sorghum halepense</i>		Poaceae	Flora of Iraq
<i>Sparganium americanum</i>		Sparganiaceae	Missouri plant
<i>Sparganium erectum</i>		Sparganiaceae	Flora of Iraq
<i>Stachys kermanshabensis</i>		Labiataeae	Photographic Guide to wild flowers of Lebanon
<i>Steptornomphus sp</i>		Compositae	Photographic Guide to wild flowers of Lebanon
<i>Stipagrostis plumosa</i>		poaceae	Flora of Iraq
<i>Tamarix gallica (T.pentandra)</i>	French Tamarisk	Tamaricaceae	Flora of Iraq
<i>Tamarix sp</i>		Tamaricaceae	Flora of Iraq
<i>Tamus communis</i>		Dioscoreaceae	Flora of Iraq
<i>Tamus sp</i>		Dioscoreaceae	Flora of Iraq
<i>Taraxacum sp</i>		Asteraceae	Photographic Guide to wild flowers of Lebanon
<i>Taraxacum officinale</i>		Asteraceae	Photographic Guide to wild flowers of Lebanon
<i>Teucrium polium</i>		Labiataeae	Photographic Guide to wild flowers of Lebanon
<i>Thymbra sp</i>	Thymbra	Labiataeae	National herbarium of Iraq
<i>Thymbra spicata</i>		Labiataeae	National herbarium of Iraq
<i>Thymus syriacus</i>		Labiataeae	National herbarium of Iraq
<i>Tragopogon buphthalmoides</i>		Compocetae	Flora of Iran
<i>Tragopogon sp</i>		Compositae	Flora of Iran
<i>Trachomitum venetum subsp. Sarmatiense</i>		Apocynaceae	Flora of Iraq
<i>Tribulus terrestris</i>	Puncturevine	Zygophyllaceae	Flora of Iraq
<i>Trifolium arvense</i>	Wheat	Fabaceae	Flora of Iraq
<i>Trifolium dusii</i>		Fabaceae	Flora of Iran
<i>Trifolium pratense</i>	Red Clover	Fabaceae	Flora of Iraq
<i>Trifolium repens</i>	White Clover	Fabaceae	Flora of Iraq
<i>Trifolium sp</i>		Fabaceae	Flora of Iraq
<i>Trigonella hamosa</i>		Fabaceae	Flora of Iraq
<i>Triticum sp</i>		Poaceae	Flora of Iraq
<i>Umbilicus intermedium</i>		Crassulaceae	Flora of Iran
<i>Urospermum picrnides</i>		Compositae	Flora of Iran
<i>Typha domingensis</i>	Cattail	Typhaceae	Flora of Iraq
<i>Typha lugdunensis</i>		Typhaceae	Flora of Iraq
<i>Typha sp</i>		Typhaceae	Flora of Iraq
<i>Urtica sp</i>		Urticaceae	Flora of Iraq
<i>Urtica urens</i>		Urticaceae	Flora of Iraq
<i>Vaccaria segetalis</i>		Caryophyllaceae	National herbarium of Iraq
<i>Vaccaria sp</i>		Caryophyllaceae	National herbarium of Iraq
<i>Vallisneria spiralis</i>	Eelgrass	Poaceae	Flora of Iraq
<i>Velezia rigida</i>		Caryophyllaceae	Flora of Iran
<i>Verbascum alceoides</i>		Scrophulariaceae	Systematic Study of The Genus <i>Verbascum</i> (Scrophulariaceae) As it is Occurs in Iraq. University of Baghdad.
<i>Verbascum agrimoniifolium</i>		Scrophulariaceae	Systematic Study of The Genus <i>Verbascum</i> (Scrophulariaceae) As it is Occurs in Iraq. University of Baghdad.
<i>Verbascum blattaria</i>		Scrophulariaceae	Systematic Study of The Genus <i>Verbascum</i>

Scientific name	Common name	Family-scientific	Source
			(Scrophulariaceae) As it is Occurs in Iraq. University of Baghdad.
<i>Verbascum macrocarpum</i>		Scrophulariaceae	Systematic Study of The Genus <i>Verbascum</i> (Scrophulariaceae) As it is Occurs in Iraq. University of Baghdad.
<i>Verbascum mucronatum</i>		Scrophulariaceae	Systematic Study of The Genus <i>Verbascum</i> (Scrophulariaceae) As it is Occurs in Iraq. University of Baghdad.
<i>Verbascum sp</i>	Verbascum	Scrophulariaceae	Systematic Study of The Genus <i>Verbascum</i> (Scrophulariaceae) As it is Occurs in Iraq. University of Baghdad.
<i>Veronica leiocarpa</i>		Scrophulariaceae	Systematic Study of The Genus <i>Verbascum</i> (Scrophulariaceae) As it is Occurs in Iraq. University of Baghdad.
<i>Verbena sp</i>		Verbenaceae	Flora of Iran
<i>Vicia sativa</i>		Fabaceae	Flora of Iraq
<i>Vicia assyriaca</i>		Fabaceae	Flora of Iraq
<i>Vicia variabilis</i>		Fabaceae	Flora of Iraq
<i>Vicia sp</i>		Fabaceae	Flora of Iraq
<i>Vicia villosa</i>		Fabaceae	Flora of Iraq
<i>Vitex sp</i>		Verbinaceae	Flora of Iraq
<i>Vitis sp</i>		Vitaceae	Flora of Iraq
<i>Vitis vinifera</i>		Vitaceae	Flora of Iraq
<i>Xanthium strumarium</i>	Cocklebur	Solanaceae	A Dictionary of Kurdistan Medicinal Plant
<i>Zeygandra iranica</i>		Campanulaceae	Flora of Iran
<i>Ziziphus sp</i>		Ramnaceae	Flora of Iraq
<i>Zoegea leptaurea</i>		Compositae	Flora of Iran
<i>Zoegea sp</i>		Compositae	Flora of Iran